

Obsessive Compulsive Disorder: Moral reasoning, imagery and guilt

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I would like to dedicate this thesis to my mother, Rosalyn Dale, who sadly passed away suddenly during my studies.

Abstract

OCD is a common mental health problem which causes significant distress and reduced quality of life. Recovery rates remain low; behavioural and cognitive-behavioural models may be missing key constructs. People with OCD report higher levels of responsibility than the general population. If people with OCD feel responsible for preventing harm, it follows that they feel guilty about the prospect of causing harm. Pathological levels of guilt are associated with a poor prognosis in people with OCD. People with OCD also report distressing imagery, which is linked with high levels of emotional arousal. If people with OCD experience high levels of distress, negative imagery and guilt, they may be more sensitive to moral concerns.

This study recruited 205 people to test three hypotheses relating to morality, imagery and guilt. Firstly, it was proposed that people in the low-OC group would demonstrate an intention bias and those in the high-OC group would not. Secondly, more frequent use of imagery would be associated with higher levels of OCD symptomatology, distress and guilt. Finally, state and trait guilt would mediate the relationship between imagery and OCD symptomatology. Participants completed an online survey comprised of questionnaires, moral dilemmas and a visual/verbal task. People in both the low- and high-OC groups demonstrated the intention bias, meaning the expected difference in moral judgments was not found. Imagery was associated with higher levels of OCD symptomatology, state and trait guilt but not distress. State and trait guilt also partially mediated the relationship between imagery and OCD symptomatology. These findings were considered in relation to the existing literature and the strengths and limitations of the study were discussed. The results suggested that future research should focus on developing interventions targeted at pathological guilt and distressing imagery.

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1 Introduction

1.1 Outline

The present study aimed to explore moral judgments, guilt, and imagery in people with Obsessive Compulsive Disorder (OCD). This introductory literature review describes pertinent research drawn from the fields of moral psychology and philosophy and explains how this research links to the current study. The review will briefly describe relevant behavioural and cognitive models of OCD, including a consideration of research from analogue samples. It will explore recent literature, which indicates that responsibility and guilt have a key role in the maintenance of OCD. These morally relevant considerations affect the decisions people with OCD make and could be linked with obsessions and compulsions.

The review will go on to discuss the role of imagery in psychopathology and OCD, before considering relevant moral philosophy literature. This will include models of moral decision-making in non-clinical populations, along with an overview of the main characteristics of moral judgments. Finally, this chapter will focus on one specific bias found in moral decision-making (the ‘intention bias’) which may be relevant to understanding OCD. This will lead on to an outline of the rationale for the study and the main study hypotheses.

1.2 Background

OCD is a common mental health problem that causes significant distress and reduced quality of life. The disorder can lead to pervasive functional impairment which affects individuals’ work, social and family life (Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009). It is thought to affect approximately 2-3% of the population (Kessler, Chiu, Demler, & Walters, 2005) and is ranked by the World Health Organisation (WHO) as among the ten most

debilitating mental health disorders (OCD-UK, 2017). The course of OCD tends to be chronic without effective treatment (Öst, Havnen, Hansen, & Kvale, 2015).

OCD is diagnosed if people are (a) having “recurrent and persistent thoughts, urges, or images that are experienced... as intrusive and unwanted, and that in most individuals cause marked anxiety or distress” (American Psychiatric Association, 2013, p. 237). People may also be (b) engaging in “repetitive behaviours... (e.g. hand washing, ordering, checking) or mental acts... (praying, counting, repeating words silently) which the individual feels driven to perform in response to an obsession... aimed at preventing or reducing anxiety or distress, or preventing some dreaded event or situation” (American Psychiatric Association, 2013, p. 237). In order to meet diagnostic criteria for OCD, the obsessions and/or compulsions must be “time-consuming (i.e. take more than one hour per day) or cause clinically significant distress or impairment” (American Psychiatric Association, 2013, p. 237).

The treatment of choice for OCD is either Cognitive Behavioural Therapy (CBT) or Exposure and Response Prevention (ERP). In the case of severe OCD, this can be combined with medication in the form of a selective serotonin reuptake inhibitor (SSRI; NICE, 2014). A recent meta-analysis looked at the efficacy of CBT, as well as potential moderators that may be associated with treatment outcome (Olatunji, Davis, Powers, & Smits, 2013). CBT outperformed control conditions on the primary outcome measures at post-treatment and follow-up, however the authors concluded that more research is needed into maintenance processes in OCD that could be a target for more effective treatment options (Olatunji et al., 2013). The recovery rates after recommended treatment are approximately 50-60% (Fisher & Wells, 2005). It is possible that psychological models may be missing important aetiological factors and maintenance processes that could provide an insight into alternative treatments (Chiang, 2013). Despite several years of research into cognitive-behavioural models, the

recovery rates remain unchanged and there is considerable scope to improve treatment efficacy (Fisher & Wells, 2005).

1.3 Theoretical models of OCD

1.3.1 Behavioural theory and ERP. To date, several psychological models accounting for the development and maintenance of OCD have been proposed (Altın & Gençöz, 2011). Initial research focused on a behavioural understanding of OCD (Markarian et al., 2010). According to the behavioural model of OCD, the disorder develops when an initially non-threatening stimulus occurs at the same time as an anxiety-provoking stimulus (Hodgson & Rachman, 1977). Via the process of classical conditioning, an anxiety response becomes associated with an objectively non-threatening stimulus. When people experience heightened levels of anxiety, they are driven to respond by engaging in compulsive behaviours. As anxiety levels then subside, the compulsive behaviours are reinforced through operant conditioning (Mowrer, 1960).

This behavioural understanding of OCD led to the development of ERP as a treatment. The rationale for ERP was that exposing individuals to the feared stimulus for a prolonged period of time would result in habituation (i.e., anxiety levels will subside naturally over time). While exposed to the feared stimulus, individuals are asked not to engage in compulsive behaviours or rituals. Behavioural theorists (e.g., Abramowitz, 1996) proposed that with repeated exposure, compulsive behaviours should become extinct in the absence of reinforcement.

ERP has a recovery rate of approximately 60% (Fisher & Wells, 2005), however many people remain symptomatic following treatment (Foa & McLean, 2016). ERP has been criticised, as whilst it treats the overt compulsions found in some cases of OCD, it cannot directly address obsessional thoughts, which are a key feature of the disorder and sometimes

occur in the absence of compulsions. ERP has also been associated with a high drop-out rate and poor treatment compliance (Salkovskis & Westbrook, 1989).

1.3.2 Cognitive-behavioural theory and CBT. Due to some of the apparent problems with behavioural theory and the associated ERP treatment, research progressed to examine the content and characteristics of obsessional thoughts. In a non-clinical study, Rachman and da Silva (1978) found that their participants had intrusive thoughts that are similar in content to those found in individuals with OCD. A more recent study (Julien, O'Connor & Aardema, 2009) found that 80-99% of people in the non-clinical population have experienced intrusive thoughts at some point in their life. There is significant support for the idea that there is a continuum between 'normal' individuals and people with OCD, including cognitive-behavioural research (Hodgson & Rachman, 1977; Salkovskis, 1985) and data from non-clinical samples (Abramowitz et al., 2014).

Salkovskis (1985) drew on the finding that intrusive thoughts are a universal experience and compared intrusions to the negative automatic thoughts (NATs) described in cognitive theory (Beck, 1976). Unlike NATs, which are often consistent with an individual's belief system, intrusions are ego-dystonic. Most people experience intrusive thoughts without any related distress; however, Salkovskis (1985) proposed that people with OCD interpret the occurrence of intrusions differently. Specifically, he suggested that when people with OCD have an intrusive thought, they think that they are a bad person for having this intrusion, or that they are responsible for the intrusion and its potential consequences. This threatening appraisal of an intrusion triggers an anxiety response and people engage in compulsive behaviours to reduce their anxiety. People then experience a sense of relief as their anxiety subsides and the compulsive behaviours are reinforced.

Salkovskis' (1985) initial cognitive model has subsequently been elaborated by a number of other researchers. The Obsessive Compulsive Cognitions Working Group (OCCWG; 1997) proposed a number of belief-domains that could explain the development and maintenance of OCD, including an intolerance of uncertainty, overestimation of threat, perfectionism and a need to control thoughts. Each of these beliefs could make individuals more vulnerable to distress when they experience an intrusive thought, as they appraise intrusions as threatening. This sense of threat and elevated level of anxiety then leads to compensatory compulsive behaviour (see Figure 1.1). Rachman (1997, 1998) also proposed that the meaning of intrusive thoughts is important: if intrusions are interpreted as personally relevant and catastrophic, people will feel distressed, act to neutralise their intrusions and experience further intrusions in the future.

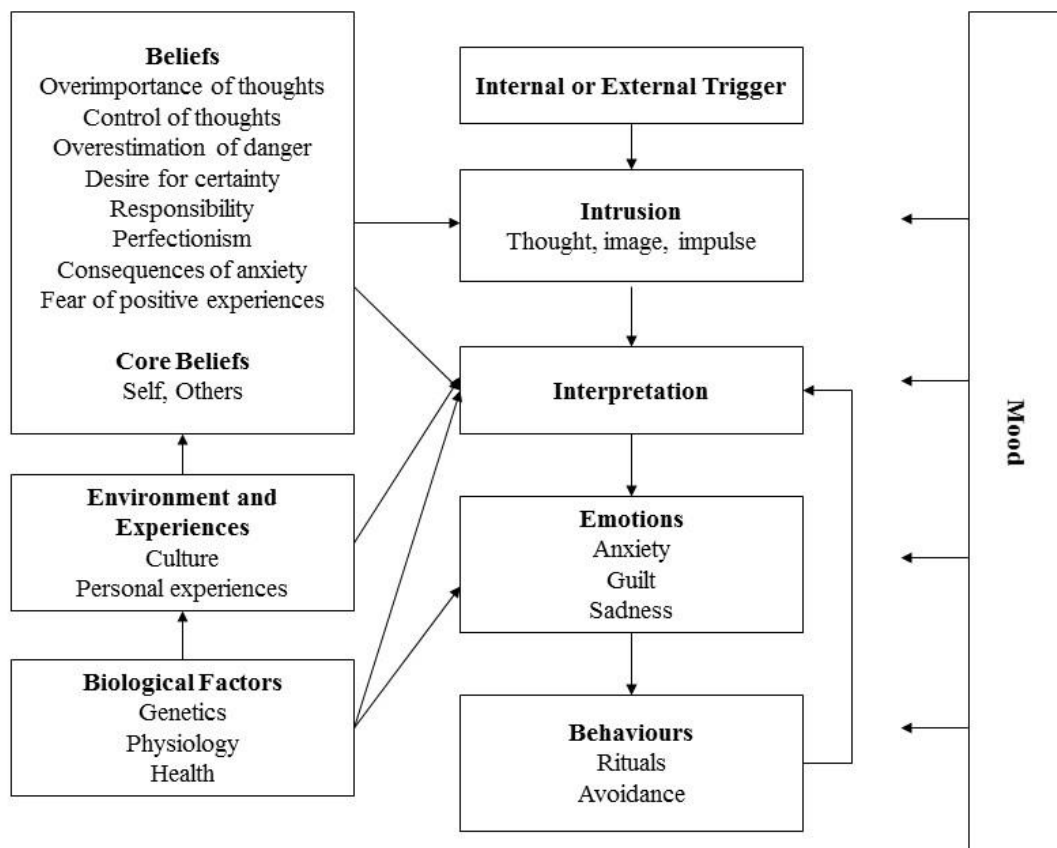


Figure 1.1. Cognitive model of OCD (OCCWG, 1997).

The dysfunctional belief systems shown in Figure 1.1 mean that people with OCD are more vulnerable to common thinking errors (Rachman, 1997; Shafran, Thordarson, & Rachman, 1996). For example, people with OCD may think that having a distressing intrusive thought is the same as acting in line with that thought. The concept of ‘thought-action fusion (TAF)’ or ‘magical thinking’ leads individuals to believe that if they think about bad things, they will act consistently with those thoughts or cause bad things to happen.

1.3.3 Dysfunctional appraisals: responsibility. Individuals with OCD respond to the belief that they will be responsible for bad things happening by taking action to prevent such consequences. This presents as compulsive behaviour. Altın and Gençöz (2011) proposed that individuals will take action in response to a cognitive intrusion because they believe that they will be responsible for harm if they do not. Researchers have therefore considered the possibility that people with OCD consider themselves highly responsible for preventing harm coming to themselves or others. Salkovskis, Richards, and Forrester (1995, as cited in OCCWG, 1997, p. 677) defined responsibility in the context of OCD as “... the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes may be actual, that is having consequences in the real world, and/or at a moral level.”

Salkovskis (1996) proposed that people with OCD have higher levels of responsibility than the general population. This sense of responsibility is a consequence of the belief that individuals have the power to prevent bad outcomes from occurring. In a study with a non-clinical sample, Mancini, D’Olimpio, and Cieri (2004) found that when perceived responsibility was manipulated and increased, obsessive-like behaviour also increased as a consequence. When people believe they are responsible for a bad outcome, they are more likely to try and take action to prevent it. In an earlier study, Ladouceur et al. (1995) found a similar effect: when participants were made to feel responsible for the outcome of their

actions, they became more preoccupied with how they performed an action and demonstrated increased hesitation and checking. These studies show that in non-clinical populations, there is a clear positive correlation between level of responsibility and OC-type symptoms. In a recent meta-analysis, Abramowitz et al. (2014) argued that findings in non-clinical samples are highly relevant to understanding psychopathology in clinical populations, as OCD symptoms exist on a spectrum. If responsibility is correlated with OCD symptoms in a non-clinical population, this has important implications for understanding how this construct is related to OCD symptoms in a clinical population.

Salkovskis (1996) also stated that the increased sense of responsibility found in individuals with OCD may extend beyond the prevention of bad outcomes in the real world to the idea that bad outcomes should be prevented at a purely moral level. As the concept of responsibility includes a moral component, researchers have recently started to investigate the role that heightened moral sensitivity may play in perpetuating OCD symptoms (Doron, Sar-El, & Mikulincer, 2012; Franklin, McNally, & Riemann, 2009).

It is possible that heightened moral sensitivity may be more or less relevant to particular subtypes of OCD, depending on the nature of intrusive thoughts and images in each subtype. Intrusions may be interpreted as more or less morally reprehensible depending on their content, which is linked to the subtype(s) of OCD that an individual has. Sookman, Abramowitz, Calamari, Wilhelm, and McKay (2005) proposed that there are four main subtypes of OCD: contamination/cleaning, checking (evoked by harming, aggressive, or sexual obsessions), obsessions without overt compulsions, and hoarding. Researchers have found that heightened moral sensitivity is related to OC-like compulsions to clean (e.g., Doron, Kyrios, & Moulding, 2007; Doron et al., 2012; Zhong & Liljenquist, 2006). Doron et al. (2007) also found that heightened moral sensitivity is related to checking compulsions. Moral sensitivity has clearly been implicated in the cleaning and checking subtypes of OCD.

It could also be the case that this construct is relevant to obsessions without overt compulsions, as ‘moral TAF’ (Salkovskis, Richards, & Forrester, 1995) could mean that simply having a ‘bad’ thought elicits high levels of guilt, shame and anxiety (Shafran, Thordarson, et al., 1996). There is no evidence that moral sensitivity is relevant to the hoarding OCD subtype, however there is a growing body of evidence that hoarding is distinct from OCD and should not be considered a subtype of the disorder (Frost, Hristova, Steketee, & Tolin, 2013). The nature of intrusions (image or verbal thought, more or less morally relevant) might determine the strength of an individual’s emotional response and subsequent compulsive behaviour, and it is possible that these may differ as a function of subtype. However, examination at the level of subtypes was beyond the scope of the present study.

1.3.4 Guilt and OCD. As heightened moral sensitivity has been linked with certain subtypes of OCD, it has been proposed that guilt (a moral emotion) may also play a part in the maintenance of the disorder (Shapiro & Stewart, 2011). Mancini and Gangemi (2004) proposed that people with OCD are afraid of feeling guilty because they feel responsible for preventing bad outcomes. Chiang (2013) also pointed out that, in order to experience guilt, an individual typically feels responsible for a transgression. If people with OCD are more likely than the general population to evaluate themselves as responsible for preventing harm, it follows that they would feel guilty in anticipation of harm occurring. The concepts of responsibility and guilt are clearly linked.

Guilt has been thought of as an adaptive social emotion that has a strong evolutionary importance in preventing humans from harming each other (e.g., Basile, Mancini, Macaluso, Caltagirone, & Bozzali, 2014). Kugler and Jones (1992) define guilt as an emotion that arises when a moral or social standard is violated. At a moderate level, guilt serves a positive social function in inhibiting harmful behaviour or in stimulating impulses to seek forgiveness; however, excessive guilt can result in psychopathology (Basile et al., 2014).

Mancini and Gangemi (2004) proposed that high levels of guilt are associated with greater symptom severity in OCD. One study showed that when a group of non-clinical participants were made to feel guilty, this experience led to OCD-like symptoms: an increased sense of responsibility, intrusive thoughts and a more developed sense of threat (Gangemi, Mancini, & Van den Hout, 2007).

Evidence from non-clinical functional neuroimaging studies also supports the link between high levels of guilt and OCD symptomatology. Researchers have found that the experience of guilt is associated with the activation of regions in the brain that have previously been implicated in OCD (Hennig-Fast et al., 2015; Mancini & Gangemi, 2015; Takahashi et al., 2004). Similarly, in a clinical population, Jankowski and Takahashi (2014) found that people with OCD demonstrated increased activation in areas of the brain linked with the processing of guilt. Furthermore, Harrison et al. (2012) proposed that people with OCD can be defined as ‘hypermoral’ as they show differential brain activation compared with controls. People with OCD demonstrate increased activation of the medial orbitofrontal cortex, left dorsolateral prefrontal cortex, and middle temporal gyrus. These regions of the brain have previously been linked with the experience of moral emotions such as guilt and shame.

In clinical populations, guilt has been linked with the experience of moral, sexual and religious obsessions and may also be a factor in aggressive, contamination-related and doubting compulsions (Shapiro & Stewart, 2011). However, researchers have provided different accounts of the roles of state and trait guilt in OCD. For the purposes of this review, ‘state guilt’ is defined as a temporary affective experience, which results from recently violating a moral standard and ‘trait guilt’ is defined as stable and enduring, linked with historical events (Kugler & Jones, 1992).

Trait guilt has been associated with a higher level of OCD symptomatology and particularly ‘not just right experiences’ (Chiang, 2013; Mancini, Gangemi, Perdighe, & Marini, 2008). Some studies have found that both state and trait guilt are important predictors of OCD symptomatology (Nissenson, 2006; Shafran, Watkins, & Charman, 1996; Steketee, Quay, & White, 1991). Other researchers have found that state guilt is an important predictor of OCD symptomatology *only* in people who self-report high trait guilt (Gangemi et al., 2007). Gangemi et al. (2007) found that when people were asked to write about a guilt-related life event (state-guilt induction), participants with high levels of trait guilt were more likely to evaluate a negative event as probable and severe. In other words, state guilt interacts with underlying trait guilt to cause OCD-like experiences. However, all of these studies were cross-sectional in nature, making it difficult to draw conclusions about whether guilt in OCD is a result of a temporary experience (state-guilt) or a more stable factor (trait-guilt; Shapiro & Stewart, 2011).

More recently, Melli, Chiorri, Carraresi, Stopani, and Bulli (2015) looked at how trait guilt relates to the number of unacceptable thoughts that an individual experiences. They found that there were weak but significant positive correlations between trait guilt and unacceptable thoughts. However, regression analyses controlling for depression and anxiety showed that trait guilt was not a significant predictor of any dimension of OCD symptomatology. The evidence for a link between state- or trait-guilt and OCD is mixed and it is clear that further research is needed.

Researchers have therefore started to investigate different types of guilt and whether it could actually be a fear of experiencing guilt that drives obsessions and compulsions (Mancini & Gangemi, 2004). In support of this idea, D’Olimpio and Mancini (2014) induced a fear of guilt in people with OCD by asking them to listen to a story in which the protagonist felt guilty. They found that when people with OCD felt more guilty this increased the frequency

of checking behaviour. Reuven, Liberman, and Dar (2013) found that people with OCD who washed their hands during an experimental procedure reported a reduction in the intensity of distressing moral emotions, including guilt. Also, Gangemi et al. (2007) induced guilt in a non-clinical population and found that this caused people to appraise a negative outcome as both more likely and more severe.

There may be a distinction in OCD between different types of guilt. Mancini and Gangemi (2004) suggested that ‘deontological guilt’ arises when someone believes that they have violated a moral rule and ‘altruistic guilt’ arises when someone feels concerned that they have caused harm or pain to other people. In an fMRI study, Basile et al. (2014) showed that people with OCD are particularly sensitive to the induction of deontological guilt but not to altruistic guilt. People with OCD showed lower levels of activation in brain regions associated with the experience of deontological guilt than control participants (Basile et al., 2014). The authors proposed that this difference could be explained by increased processing efficiency (‘Neural efficiency hypothesis’; Neubauer & Fink, 2009), as people with OCD are likely to be frequently exposed to the experience of guilt and may develop a learned response.

Mancini and Gangemi (2015) went on to explore whether people with OCD are more motivated than non-clinical controls to prevent deontological guilt compared with altruistic guilt. Their first study showed that people with OCD make more cautious decisions than non-clinical controls. OCD symptoms could therefore be understood as a consequence of the overvalued goal to prevent deontological guilt (i.e., not to violate moral norms; Mancini & Gangemi, 2015). People with OCD behave differently when exposed to the possibility of experiencing deontological guilt. Additionally, a second study showed that when deontological guilt was induced in non-clinical participants, they acted more cautiously than under normal conditions (Mancini & Gangemi, 2015). Deontological guilt clearly has an effect on decision-making, in both clinical and non-clinical samples.

If fear of deontological guilt drives compulsive behaviour in non-clinical and clinical samples, it follows that deontological guilt may be an important treatment target in people with a diagnosis of OCD (Mancini & Gangemi, 2015). Confirming this, Cosentino et al. (2012) showed that an intervention to increase acceptance of the experience of guilt led to a reduction in obsessions in people with OCD.

The experience of guilt is clearly linked with OCD symptomatology, although from the literature it remains unclear whether state guilt, trait guilt, deontological guilt, or fear of guilt provide the best explanation for the symptoms seen in people with OCD. Further research is needed into specific types of guilt and how these might be related to OCD symptomatology. The literature in this area is still developing and it is hoped that the present study will add to this knowledge base.

1.4 Imagery

In addition to the research into responsibility and guilt in OCD, there has also been a recent focus on imagery and how this mental process could be used to develop new treatments for the disorder. This review will now consider the research into imagery in psychopathology generally, before focusing on research that is particularly relevant to OCD.

In many clinical disorders, imagery has been found to evoke high levels of emotional arousal which then plays a key part in maintenance cycles (Holmes & Mathews, 2010). Imagery can involve multiple sensory modalities, including smells, sounds or distressing bodily sensations. The powerful sensations and emotions evoked by imagery may be a critical part of psychopathology (Holmes, Mathews, Mackintosh, & Dalgleish, 2008).

Initial research into imagery by Lang (1979) proposed that mental images may directly influence emotional systems in the brain, particularly when these images contain information that is relevant to associated autonomic or behavioural responses. For example, if someone

imagines a poisonous spider, their autonomic response might include breathing faster or sweating, they may experience intense fear and their behavioural instinct might be to prepare to run away. Distressing images have a direct impact on people both physiologically and emotionally.

In OCD, intrusive images link with compulsive behaviour. For example, images of germs invading the skin (contamination) can lead to increased washing behaviour (Rachman, 2007). Speckens, Hackmann, Ehlers, and Cuthbert (2007) found that 81% of participants with severe OCD reported intrusive imagery and in 76% of these participants, the images were followed by engagement in compulsive behaviours. The vivid intrusive images reported in OCD may make moral considerations salient, for example if people imagine the suffering of potential victims (Holmes & Mathews, 2005). People with OCD often foresee a range of possible negative outcomes such as their home burning down or their loved ones catching an incurable disease (Salkovskis et al., 1995). These distressing images might also make people more likely to believe that their feared outcome will actually occur (Holmes & Mathews, 2010).

It is clear that distressing intrusive images lead to a powerful emotional response. Holmes and Mathews (2010) noted that intrusive images lead to a more intense emotional response than verbal intrusions. This could be because images are vivid and realistic, whereas verbal thoughts can be more easily dismissed as they are more abstract (e.g., Holmes & Mathews, 2010; Trope & Liberman, 2010). Pearson, Naselaris, Holmes, and Kosslyn (2015) argue that the content of images compared with verbal thoughts is subtly different. The distinction between images and verbal thoughts is likely to be important in therapy, however mental health clinicians have not always been trained to ask whether clients experience distressing imagery, although they routinely ask about verbal thoughts (Holmes, Blackwell, Burnett Heyes, Renner, & Raes, 2016). If distressing imagery elicits strong emotion it seems important to address this at assessment and in therapy, however imagery is not typically

addressed in standard evidence-based treatment for OCD. As distressing imagery is such a common experience in OCD, information about it should provide an important contribution to a more complete understanding of the development and maintenance of the disorder (Speckens et al., 2007). Building on the existing evidence base for imagery-based treatments in other anxiety disorders (e.g., Arntz, 2012), researchers have started to develop novel imagery-based treatments tailored to OCD in the hope that therapy outcomes can be improved (e.g., Veale, Page, Woodward, & Salkovskis, 2015).

Imagery rescripting has been developed for use in a number of anxiety disorders to update the meaning of aversive memories (Arntz, 2012). It has been proposed that addressing aversive images in OCD may lead to a reduction in symptoms, as measured on the Yale-Brown Obsessive Compulsive Scale (YBOCS; Goodman et al., 1989). In a case series, Veale et al. (2015) demonstrated that, after one session of imagery rescripting targeting an aversive memory, there was a clinically significant improvement in OCD symptoms at three-month follow-up. The authors suggested that they would cautiously recommend the use of imagery rescripting in therapy for OCD; however, the sample was small and there was no control group. Nevertheless, other authors have also suggested that imagery rescripting is a promising future direction for psychological therapy (Holmes et al., 2016).

In summary, it is clear that distressing imagery is common in OCD, plays an important part in maintenance cycles and may therefore be an important target for new interventions.

1.5 Moral philosophy

This literature review has so far considered guilt and imagery and the relationship of these constructs to OCD symptomatology. This research in relation to imagery and guilt is drawn from the clinical psychology literature. However, imagery and guilt have also been extensively researched in the moral philosophy literature. Moral concerns seem particularly

salient in people with OCD (e.g., Reuven et al., 2013) and this review will now consider how the moral philosophy literature could potentially add to our understanding of OCD.

Guilt has often been described as a ‘moral emotion’ (Chiang, 2013) and moral emotions accompany, and may have a causal influence on moral judgments (Bruni, 2013). If people with OCD are sensitive to the experience of guilt, it is possible that moral judgments in this population may be qualitatively different from those made by people in the general population. Considering imagery, Caruso and Gino (2011) found that when participants were asked to close their eyes and make moral judgments, they engaged in more mental simulation (or use of imagery). This greater use of mental simulation was associated with extreme moral judgments, as participants more frequently judged immoral behaviours as unethical.

Before going on to consider why moral judgments might be different in people with OCD, this review will first provide a brief overview of the main concepts and models in the moral philosophy literature.

1.5.1 Moral judgments. Many philosophers have attempted to explain the reasoning processes behind moral judgments in the general population. Mikhail (2009) proposed that moral judgments are the product of a psychological system that makes use of objective rules, known as the ‘universal moral grammar’. According to this model, human morality is based on innate, ‘absolute’ knowledge. This idea is supported by the fact that ethical systems across history and culture have consistent moral principles, for example ‘murder is wrong’ (Bruni, 2013).

However, people do not always act consistently with these absolute principles and people have different cultural and individual concepts of right and wrong. Morality can therefore be understood as relative or changeable, dependent on the circumstances. People often struggle to determine what is right or wrong, as principles may be in conflict (Bartels, Bauman,

Cushman, Pizarro, & McGraw, 2014). Defining moral judgments as either absolute or relative may therefore be too simplistic.

In the philosophy literature, moral judgments are typically classified on the intrinsic quality of an action (deontology) or its consequences (utilitarianism) (e.g., Bartels et al., 2014). The process of making a moral decision can generate cognitive conflict, as there may be a choice between the rights of the individual and the greater good (i.e., deontological vs. utilitarian decision; Amit, Gottlieb, & Greene, 2014). Typically, philosophers have argued that morality is one or the other, absolute or relative; however these viewpoints are clearly in conflict. People do not appear to be rigidly deontological or utilitarian in the moral judgments that they make. Consequently, a substantial body of research has attempted to account for the moral flexibility that people exhibit (Waldmann, Nagel, & Wiegmann, 2012). An alternative understanding of morality is required to account for why people sometimes follow universal principles and at other times choose not to do so.

1.5.2 Dual process model. Some theorists have claimed that morality is a product of reasoning, whereas others argue that morality originates in intuitive mental processes (Haidt & Joseph, 2004). More recently, researchers have attempted to reconcile these conflicting views by claiming that affective and cognitive processes jointly contribute to moral judgments (Greene et al., 2009; Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Greene, Nystrom, Engell, Darley, & Cohen, 2004). According to the ‘dual-process model’, affective reactions are immediately elicited by moral stimuli and then these reactions are overridden by cognitive processing if given sufficient time, motivation and resources. The psychological processes involved are distinct and independent, so they can produce conflicting decisions in response to difficult moral dilemmas (Conway & Gawronski, 2013).

Where principles are in conflict, researchers have sought to understand the cognitive processes underlying moral judgments. Recent research has shown that when presented with moral dilemmas that describe inflicting harm on one person to help others, people involuntarily experience a negative emotional reaction to the prospect of causing harm (Greene et al., 2004). This negative emotional reaction facilitates automatic processing and means that people are more likely to make a deontological moral decision. When people are given time to consider their response and use their cognitive resources to weigh up their options, they are more likely to make a utilitarian judgment. In other words, deontological judgments are preferentially supported by automatic emotional processing, whilst utilitarian judgments are facilitated by controlled cognitive processing unfolding over time.

There is a significant body of evidence to support the validity of this model. Greene, Sommerville, Nystrom, Darley, and Cohen (2001) showed that when people make deontological moral judgments, there is increased activation in areas of the brain linked with the processing of emotions. Cushman, Murray, Gordon-McKeon, Wharton, and Greene (2012) found that participants who demonstrated high levels of physiological and affective arousal were significantly more likely to make deontological moral judgments. There is clear evidence that a strong affective reaction predicts a greater propensity to make deontological moral decisions.

Conversely, when negative affect was reduced by showing a humorous video clip, people made fewer deontological decisions (Valdesolo & DeSteno, 2006). Ciaramelli, Muccioli, Ládavas, and di Pellegrino (2007) also found that people with damage to areas of the brain associated with emotional processing made fewer deontological judgments. It appears that when emotional processing is impaired or negative affect is reduced, people tend to make fewer deontological judgments. This again supports the idea that deontological judgments involve automatic emotional processing.

Regarding the second assumption of the dual-process model, when cognitive processing is impeded, people appear to find it more difficult to make utilitarian judgments. Greene et al. (2008) found that when participants were asked to perform a digit search task, alongside making moral decisions, their reaction time increased significantly when making utilitarian judgments. Suter and Hertwig (2011) showed that if participants were put under time pressure or distracted by other information, the frequency and speed of utilitarian choice reduced. An fMRI study showed that when participants were able to use controlled cognition, they more frequently made utilitarian judgments (Cushman et al., 2012). Carmona-Perera, Martí-García, Pérez-García, and Verdejo-García (2013) also found that if levels of negative emotional arousal remained low, participants were more likely to make utilitarian choices, possibly because they were less distracted and able to use controlled cognition.

These studies all provide support for the existence of the dual-process model of morality as they demonstrate that emotion is associated with automatic, deontological choices and cognition is associated with controlled, utilitarian choices. However, Kahane et al. (2012) and Białek and De Neys (2016) assert that the dual-process model of morality is flawed. These researchers proposed that the distinction between deontological and utilitarian judgments is confounded by the distinction between intuitive and counterintuitive judgments. Kahane et al. (2012) showed that it was more difficult to make counterintuitive judgments compared with intuitive judgments, regardless of whether these judgments were utilitarian or deontological in nature. Białek and De Neys (2016) found that deontological decisions are made more slowly and with less confidence when people are presented with moral dilemmas that describe counterintuitive choices.

1.5.3 Construal level theory. As an alternative to the dual-process model, Trope and Liberman (2010) put forward ‘construal level theory’ (CLT). According to CLT, information can be processed at a high (abstract) or low (concrete) level. Utilitarian judgments are

associated with high-level construals, as considering outcomes or ‘ends’ uses more abstract thought processes. Deontological judgments are associated with low-level construals, as considering immediate harm or ‘means’ uses concrete thought processes. In an experimental study, Körner and Volk (2014) linked these ideas with the dual-process model and proposed that information can be processed abstractly or concretely according to its ‘psychological distance’. Concrete or vivid information about means caused emotional arousal and led to that people making more deontological judgments, whereas abstract information about ends was more difficult to conceptualise and led to people making more utilitarian judgments.

1.5.4 Moral principles. Building on the research into models of understanding morality (described above), moral psychology researchers have also sought to understand the cognitive processes that underlie moral decisions, in order to clarify general ‘moral principles’ that people are inclined to follow.

In a study with a non-clinical population, Greene et al. (2001) showed that participants had a stronger emotional reaction (therefore made more deontological decisions) when asked to choose a course of action that included personal contact with a potential victim. Similarly, Greene et al. (2009) demonstrated that people judge harmful actions as less morally acceptable when they involve the use of an agent’s muscles and body. ‘Personal’ moral dilemmas elicited increased activity in brain regions that have been associated with emotion and social cognition (Greene et al., 2004, 2001). However, these data are correlational and cannot demonstrate a causal relationship between an emotional response and different moral judgments.

In another non-clinical study, Cushman, Young, and Hauser (2006) investigated three principles of moral judgment that have been tested numerous times by moral philosophers:

- (1) The ‘action principle’ – harm caused as a direct result of an action is morally worse than harm as a result of inaction.
- (2) The ‘intention principle’ – harm caused deliberately is morally worse than harm that occurs as the side-effect of an action.
- (3) The ‘contact principle’ – harm caused by physical contact with a victim is morally worse than harm that occurs without personally touching somebody.

Cushman et al. (2006) found that all of these proposed moral principles were upheld in their non-clinical sample.

The three moral principles described in Cushman et al. (2006), and the ‘personal’ moral principle described by Greene et al. (2009) have been proposed by moral psychology researchers who sought to build on theories found in the experimental philosophy literature. Predominantly, this moral psychology research has been conducted with non-clinical populations as it aimed to develop our overall understanding of morality and decision-making. However, these moral principles may also have implications for understanding decision-making processes in clinical populations. Investigating the potential differences in moral reasoning between non-clinical and clinical populations would provide new information which could contribute to models of morality, as well as our understanding of psychopathology.

1.6 Moral principles in OCD

There is a growing body of evidence that moral judgments and principles may be qualitatively different in clinical populations (Moran et al., 2011; Young et al., 2010; Young, Koenigs, Kruepke, & Newman, 2012). Individuals with OCD may make different moral judgments due to the high levels of moral emotion and morally relevant cognitive biases involved in the disorder. This is an area that warrants further investigation, as to date there

has been limited research. This review will first summarise the limited research into moral judgments in OCD, which has focused on the ‘omission bias’ and deontological/utilitarian decision making. It will then continue to consider how a specific moral principle (the ‘intention bias’) could be relevant to understanding different beliefs and cognitions in people with OCD.

1.6.1 Omission and OCD. In a non-clinical study looking at how moral judgments might be related to OCD symptomatology, Siev, Huppert, and Chambless (2010) found that symptoms of OCD were negatively associated with the ‘omission bias’ (the idea that harm as the result of inaction is more morally acceptable than harm as the result of an action). In other words, people with higher levels of OCD symptomatology were less likely to demonstrate an ‘omission bias’. These participants judged harm resulting from both action and inaction as equally morally unacceptable. However, this was only the case when the dilemmas presented were relevant to typical OCD concerns (e.g., washing and checking scenarios). This replicated the findings of a similar earlier study conducted by Wroe and Salkovskis (2000). Taken together, these studies provide support for the idea that people with OCD make different moral decisions, but only when these decisions are related to OCD-specific concerns.

1.6.2 Utilitarian and deontological decision making in OCD. Moral decision making has been investigated in participants with OCD compared with control participants. Franklin et al. (2009) found that participants who reported strongly endorsing responsibility attitudes were less likely to make utilitarian decisions. However, whilst there was a trend in the direction of this prediction, there were no significant differences in the moral decisions made by the OCD and control groups. The authors concluded that there was no general deficit or difference in moral reasoning in people with OCD compared with control participants. They suggested that further research was required to explore whether potential differences in moral reasoning are restricted to specific domains.

In a more recent study, Whitton, Henry, and Grisham (2014) investigated whether there were differences in utilitarian moral reasoning, inhibitory control, cognitive flexibility and disgust in participants with a diagnosis of OCD, participants who met criteria for an anxiety disorder and a non-clinical control group. The three-group design is a strength compared with other research into moral reasoning which has typically included only an OCD and a control group, however it should be noted that the sample size was small. The authors found that people with OCD less frequently chose a utilitarian action compared with non-clinical controls, however there was no difference in moral reasoning between people with OCD and those with another anxiety disorder. In this study, Whitton et al. (2014) presented participants with ‘benign’, ‘personal’ and ‘impersonal’ dilemmas and the difference in frequency of utilitarian decisions between people with OCD and non-clinical controls was *only* found in the case of ‘impersonal’ dilemmas. In line with the Franklin et al. (2009) study, it could therefore be the case that differences in moral reasoning in OCD are confined to specific domains.

As is clear from the above studies, the moral decisions made by individuals with OCD appear to differ compared to nonclinical individuals. However, these potential distinctions have yet to be fully explored and understood. Differences in moral reasoning in OCD may be specific

to the subject of people's obsessions, or particular moral principles may be more or less likely to be upheld in this population.

1.6.3 Intent and OCD. A moral principle that has been well-documented in the philosophy literature is the 'intention bias', as previously mentioned in Cushman et al. (2006). According to the 'intention bias' or 'Doctrine of Double Effect' as it is known in philosophy (Foot, 1967), causing harm is justifiable if this harm is an inevitable result of an intentional action carried out with a good outcome in mind. In other words, harm that is a side-effect of an action carried out with good intentions is more morally acceptable than harm resulting directly from an action. Hauser et al. (2007) proposed that the intention principle exists universally and is part of people's 'moral competence'. However, Cushman et al. (2006) found that people were not consciously aware of the intention principle. Participants in their study rated scenarios describing harm as a side-effect of an action as more acceptable than intentional harm, but they were not able to justify their decisions. The intention principle may therefore be an unconscious bias, implying that these moral judgments are intuitive.

A number of researchers have found that a stronger emotional response is generated when people are presented with a scenario describing intentional harm compared with harm as a side-effect of an action (e.g., Decety & Cacioppo, 2012; Gray & Wegner, 2008; Russell & Giner-Sorolla, 2011). Miller and Cushman (2013) proposed that this difference in emotional intensity depends on the perceived intent of the perpetrator. If people believe that someone intends to bring about harm, they are judged as more responsible and culpable for their actions. However, Knobe (2006) found that this culpability only holds true in the case of a negative outcome from an action. If someone carries out an action which results in a positive side-effect, people are less likely to believe that they intended this to happen.

This raises questions about the idea of ‘agency’, which has been proposed as a concept that may be defined differently in mental health conditions and in OCD in particular (Oren, Friedmann, & Dar, 2016). ‘Agency’ has been defined as “the exercise of the capacity to perform intentional actions” (Schlosser, 2015, p. 1). In OCD, people may have a different understanding of intent due to ‘thought-action fusion’ (e.g., Shafran, Thordarson, et al., 1996), where people believe they are responsible for causing potential harm to themselves or others just by thinking about this harm (Salkovskis, 1996). An intrusive thought about harm is viewed as morally equivalent to harm that happens in reality.

In OCD, it could be argued that people foresee harm when they have intrusive thoughts or images. From an ethical point of view, “premeditation (being able to foresee harmful outcomes) usually makes an objectionable act seem more culpable” (Gregory and Zangwill, 1987, p. 681). In other words, foreseeing harm means that people are viewed as more responsible or blameworthy for their actions. This has interesting implications for people with OCD, who have frequent distressing intrusive thoughts and images of harm or objectionable acts occurring. However, for people with OCD, their intrusive thoughts are ‘ego-dystonic’ which means that harm is not a desired outcome.

If harm is not a desired outcome for someone, it seems relevant to consider whether they can be judged responsible or blamed for their actions. Malle, Guglielmo, and Monroe (2014) proposed that a person can be judged as blameworthy if (1) they are directly causally responsible and (2) they intended to cause harm. These judgments of blame, causality and intentionality become much more difficult in the case of accidental or attempted harm (Young, Cushman, Hauser, & Saxe, 2007).

Malle et al. (2014) proposed that an action can be judged as intentional if a person can be judged to have the desire, belief, intention, skill and awareness to carry it out. Cushman

(2008) found that when people make judgments about blame, they consider someone's beliefs about causing harm and their desire to cause harm as the most important factors. This has implications for people with OCD, who clearly have an exaggerated belief that they have the ability to cause harm. Whether harm can be viewed as intentional or not in people with OCD seems difficult to clearly understand.

Cushman (2015) stated that an act can be understood as intentional if people have a 'plan', where actions can be linked to outcomes. A 'plan' is a mental state representation of an action that will be performed to achieve a goal. People with intrusive thoughts and images may well hold in mind a harmful outcome, but their intention is usually to prevent this from happening. If a person causes harm unintentionally, it becomes relevant to ask whether a person had the 'obligation' or the 'capacity' to have prevented harm (Malle et al., 2014). Again, people with OCD may have skewed views on this due to high levels of perceived responsibility and a fear of guilt. Unintentional harm may therefore be just as morally objectionable as intentional harm for people with OCD.

There is some evidence that the 'intention bias' is not as prevalent in clinical populations. Moran et al. (2011) found that people with autism do not demonstrate an intention bias in their moral judgments. This finding was partly attributed to cognitive inflexibility. It has been proposed that people with OCD also have high levels of cognitive inflexibility (Gruner, Anticevic, Lee, & Pittenger, 2016; Whitton et al., 2014), as they may be more rigid in their thinking style and less responsive to situational changes (Soref, Dar, Argov, & Meiran, 2008).

Cognitive inflexibility may mean that people find it difficult to make decisions and accordingly, OCD has been thought of as a 'decision-making disorder'. Erhan and Balci (2016) found that higher scores on measures of OCD symptomatology predict more cautious

decision-making. In this study, people with higher levels of OCD symptomatology displayed more rumination, checking and precision-seeking behaviour. People with OCD typically gather more information during the process of making a decision and show high levels of intolerance of uncertainty (Sip, Muratore, & Stern, 2016).

The factors that influence moral decision-making in OCD could potentially provide valuable information regarding cognitive or behavioural treatment targets (Sip et al., 2016). Moral concerns such as responsibility, state-guilt, trait-guilt and a fear of deontological guilt have all been suggested as important components of maintenance cycles in OCD. The ‘intention bias’ seems particularly relevant to people with OCD, who often judge themselves harshly in terms of guilt and responsibility for harm. Understanding how people with OCD make moral decisions may help with understanding the aetiology of the disorder, however there is a lack of research applying what is known about moral judgments to a clinical population (Franklin et al., 2009).

1.6.4 Imagery, morality and OCD. As mentioned previously, imagery has been strongly implicated in the development of OCD symptomatology (e.g., Speckens et al., 2007). Imagery has also been an important line of research in the moral philosophy literature.

Amit and Greene (2012) have proposed that the dual-process model of morality is supported by evidence that deontological judgments are preferentially supported by visual processing, whereas utilitarian judgments are preferentially supported by verbal processing. In other words, if people visualise potential harm, they are more likely to make a deontological choice to avoid intentionally inflicting harm. Similarly, Miller and Cushman (2013) found that an emotional response to intentional harm is linked with consideration of the suffering a victim will have to endure. If people imagine suffering or harm in vivid detail they experience high levels of emotional arousal (Bartels, 2008).

In OCD, people experience distressing images of potentially negative outcomes which are likely to lead to intense emotions such as guilt, fear and shame, in turn affecting the moral decisions that people make. Linking this with the findings from the moral philosophy literature that high levels of emotional arousal lead to more extreme moral judgments (see section 1.5.2), it follows that people with OCD might make qualitatively different moral decisions from those in the general population. If this is the case, cognitions, emotions and beliefs about morality resulting from distressing imagery may be important future treatment targets.

In summary, there is evidence that there are differences in the moral judgments made by clinical and non-clinical populations (e.g., Young et al., 2012). Moral judgments in people with OCD have been investigated with reference to the omission bias (Wroe & Salkovskis, 2000), however other well-known moral principles have not yet been researched in this population. The current study aimed to add to the literature on moral judgments in people with OCD by focusing on the intention bias. It is hoped that investigating this moral principle in people with OCD (in addition to the morally relevant constructs guilt and imagery) could contribute to our understanding of this complex disorder.

1.7 Measurement issues

This chapter will now consider some important methodological issues relating to the constructs in this study, before concluding with a brief summary of the literature review and the study hypotheses.

1.7.1 Imagery. Given the link between imagery and levels of emotional arousal in mental health difficulties, several researchers have sought to measure how people use imagery. However, this has proved difficult, as the use of imagery is an inherently private act (Pearson et al., 2015).

Several researchers have developed self-report scales, for example, the Spontaneous Use of Imagery Scale (SUIS; Reisberg, Pearson, & Kosslyn, 2003). The SUIS consists of twelve items, which ask respondents to rate how often they engage in visual imagery in their everyday activities. More recently, the Plymouth Sensory Imagery Questionnaire has been developed, which asks participants to rate their image on a seven-point scale anchored by ‘no image at all’ (0) and ‘as vivid as real life’ (7) (Psi-Q; Baugh, Ganis, Deeprose, May, & Andrade, 2014). Both of these scales show good internal reliability: Psi-Q = .97, SUIS = .74. However, researchers have drawn a distinction between the emotional content of imagery and verbal thoughts and measuring imagery alone does not facilitate this distinction (Holmes, Mathews, et al., 2008).

In one of the first studies comparing visual and verbal processing, Vrana, Cuthbert, and Lang (1986) asked a non-clinical sample to imagine or silently repeat sentences which were classified as fearful or neutral. They found higher levels of emotional arousal when participants imagined the fearful scenarios as opposed to verbally repeating descriptions. However, the sentences were presented initially in an auditory format, so participants were always presented with verbal information first. The greater emotional impact of the imagery condition could reflect the fact that the information is presented in two modalities rather than one (Ji, Heyes, MacLeod, & Holmes, 2015).

To address this methodological problem, (Holmes, Mathews, et al., 2008) devised the Picture-Word Task (PWT). Participants were presented with a picture and word simultaneously and asked to combine the stimuli by creating a verbal representation or mental image. They were then asked to rate on a nine-point Likert scale how visual or verbal their representation was, and how emotional they found it. Holmes, Mathews, et al. (2008) found that higher ratings of emotion were significantly positively correlated with the use of visual processing strategies but not with the use of verbal processing strategies. Apart from

this study, there has been limited research into how visual and verbal processing may differentially affect emotional arousal; however a recent study supports the hypothesis that mental imagery elicits strong emotion (Pearson et al., 2015). The level of emotional response experienced during imagery is related to how vividly an individual can generate mental imagery in general (Ji et al., 2015).

1.7.2 Moral dilemmas. Historically, research into morality has been considered more relevant to philosophy than psychology. However, moral dilemmas are increasingly being used as a tool in experimental psychology to study the processes underlying moral judgments and to develop a paradigm for experimentally induced ‘cognitive conflict’ (e.g., Greene et al., 2001). Typically, these dilemmas present a situation detailing harm to one or more individuals and people are asked to choose an appropriate course of action. Moral dilemmas combined with methods from cognitive neuroscience have helped to provide insight into the psychological processes involved in making moral decisions (Cushman & Greene, 2012).

There is an ongoing debate about whether it is valid to use moral dilemmas to study the process of making a moral judgment. Asking people to consider a hypothetical situation can be problematic, as people’s ideas about how they would act might be very different from how they would act in reality (Aguilar, Brussino, & Fernández-Dols, 2013). It may also be difficult for people to refrain from including information or knowledge from outside of the scenario in their decisions (Bartels et al., 2014). Some researchers found that moral dilemmas were not a useful research tool in people with high levels of psychopathy (Bartels & Pizarro, 2011; Bauman, McGraw, Bartels, & Warren, 2014). Most moral dilemmas used in this type of research focus only on the moral concern of physical harm. These moral dilemmas are colloquially known as ‘trolley problems’ (Haidt & Joseph, 2004).

Cushman and Greene (2012) argue there is no suggestion that people's responses to moral dilemmas can predict their actual behaviour. Nevertheless, these moral dilemmas can provide an insight into people's underlying cognitive processes. By providing people with extreme moral dilemmas, it may be possible to draw more reliable conclusions about how moral judgments are made, as any underlying processes or cognitions are likely to be exaggerated (Christensen & Gomila, 2012). Presenting an individual with a moral dilemma results in emotional arousal, which is thought to play a part in the process of making moral decisions (Moll et al., 2002). If moral dilemmas provide insight into people's cognitive processes or emotional reactions when making moral decisions, they are certainly a useful research tool.

Moral dilemmas in research have increasingly been conceptualised as experimental stimuli that allow the inclusion of many variables. It is therefore important to consider confounding variables that need to be controlled for in the current study. As an example, previous research has taken into account the length of moral dilemmas, time allowed to read them, participant perspective (i.e., observer vs. protagonist) and language used (Christensen & Gomila, 2012). If the content of moral dilemmas is controlled, researchers can devise vignettes to test specific moral principles. This would allow inferences to be drawn about normative models of moral decision-making. As moral dilemmas are valid research tools and can provide useful information about moral reasoning processes in non-clinical populations, it is possible to use them to conduct research into clinical populations and consider potential differences in moral reasoning (Bartels et al., 2014). It was therefore considered appropriate to use moral dilemmas as a research tool in the current study.

In addition to the general validity of moral dilemmas as a research tool, it is also important to consider the content of the vignettes themselves (i.e., general or specific to OCD-like concerns). To date, standard moral dilemmas have been used in a number of studies that consider moral reasoning in OCD (Franklin et al., 2009; Mancini & Gangemi, 2015; Whitton

et al., 2014). Generally, researchers have used vignettes that “resemble dilemmas... discussed by contemporary moral philosophers” (Whitton et al., 2014, p. 155) and these vignettes have not been OCD-specific. Contrary to this, Franklin et al. (2009) and Wroe and Salkovskis (2000) both suggested that differences in moral reasoning might only be found when people with OCD are presented with scenarios that address their obsessional concerns. However, Whitton et al. (2014) and Mancini and Gangemi (2015) both found differences in moral reasoning in people with OCD using general moral reasoning vignettes.

Considering the use of OCD-specific vignettes, Wroe and Salkovskis (2000) designed moral dilemmas to test the ‘omission bias’ which were ‘OCD-relevant’ as they described concerns similar to typical obsessional concerns (e.g., contamination). These moral dilemmas were rated by the researchers as more or less relevant to participants’ obsessional concerns, dependent on participants’ ratings of how disturbed they were by any given dilemmas. However, it is important to note that whilst these moral dilemmas were ‘OCD-relevant’ they were not specifically designed for each individual participant and so could not address idiosyncratic concerns. Also, whilst Franklin et al. (2009) suggested that differences in moral reasoning might be limited to specific domains in people with OCD, this suggestion may have been a result of ambiguous findings as their study used a small sample and may have been statistically underpowered. Each of these studies have researched subtly different areas of moral reasoning (the omission bias and deontological vs. utilitarian reasoning respectively) from the current study which investigated the intention bias.

To summarise, there are mixed findings in the literature; some researchers have found meaningful differences in moral reasoning using general moral dilemmas (Whitton et al., 2014), some found differences using OCD-specific dilemmas (Wroe & Salkovskis, 2000) and others suggested that differences *might* be found when using OCD-specific dilemmas

(Franklin et al., 2009). The studies that have suggested the use of OCD-specific vignettes have been small with mixed findings and may have been underpowered.

As the current study is the first to investigate the intention bias in OCD, vignettes which have previously been used to investigate the intention bias (Cushman et al., 2006 – see section 2.3.5) were selected. The use of these general ‘intention’ vignettes meant that the intention bias could be tested in a direct replication of previous research. Conceptually, it would be difficult to design vignettes to test the intention bias which would also adequately address specific OCD concerns. In a previous DClinPsy project, designing OCD-specific vignettes to test utilitarian and deontological reasoning was not deemed feasible (Trafford, 2016). Also, using new OCD-specific vignettes would mean that the findings of the current study could not be compared with existing non-clinical research into the intention bias. It could be argued that to some extent all moral dilemmas are ‘OCD-relevant’ as they describe potential harm which can be prevented. For these reasons, the general moral reasoning vignettes previously used by Cushman et al. (2006) to investigate the intention bias were used in this study.

1.8 Summary

It is clear from the literature that the moral decisions people with OCD make are different from those in the general population (Jacobsen, Freeman, & Salkovskis, 2012; Wroe & Salkovskis, 2000), however it may be the case that these differences are confined to specific domains (Franklin et al., 2009). The intention bias was selected as a moral principle of interest as this seems particularly relevant to people with OCD. They seem to have a different understanding of causality due to an inflated sense of responsibility, fear of guilt and ‘thought-action fusion’ cognitive biases (Salkovskis, 1996; Shafran et al., 1996).

People with OCD frequently experience intrusive imagery (Holmes & Mathews, 2005) and it has been shown that compared with verbal intrusions, imagery generates more intense

emotional arousal (Holmes, Mathews, et al., 2008). This may be linked with the heightened experience of distress and guilt found in people with OCD (e.g., D'Olimpio et al., 2013).

However, the research to date on guilt and OCD is mixed and there are vastly different definitions of guilt. Some researchers propose that trait guilt (stable and enduring) is an important predictor of clinical obsessions (e.g., Shafran, Watkins, & Charman, 1996). Others argue that the combination of high levels of state (time-dependent) and trait guilt is associated with the increased threat perception found in people with OCD (e.g., Gangemi et al., 2007). It is apparent that there is a relationship between the experience of guilt and OCD symptoms; however, the details of this link remain unclear. It seems likely that the heightened experience of imagery and emotional arousal found in OCD may be linked in some way with the experience of guilt.

The current study aimed to integrate the diverse areas of research described above, to contribute to the developing literature on morally relevant constructs in OCD. Current cognitive models of OCD (e.g., Obsessive Compulsive Cognitions Working Group, 1997) propose that beliefs regarding the nature and importance of thoughts affect how intrusive thoughts and images are appraised by an individual. TAF (Shafran, Thordarson, et al., 1996) could mean that people with OCD interpret having a 'bad' thought as morally equivalent to harm that occurs in reality. It has been suggested that people with OCD are more sensitive to moral concerns than the general population (Melli, Carraresi, Poli, Marazziti, & Pinto, 2017).

This heightened moral sensitivity could be related to cognitive biases such as TAF, or could also be attributed to the nature of intrusions in people with OCD and how they respond to them. It is well documented that people with OCD experience intrusions in the form of distressing imagery, which elicits a strong emotional response (Holmes & Mathews, 2010).

Researchers have shown that imagery is associated with high levels of emotional arousal

which leads to automatic, deontological moral judgments (Amit & Greene, 2012). Negative emotions such as guilt are key maintaining factors in OCD (Shapiro & Stewart, 2011) and could be linked with altered moral reasoning processes, particularly if people with OCD are sensitive to the experience of guilt.

In summary, people with OCD demonstrate cognitive biases which could affect their understanding of morality. The experience of distressing imagery in OCD could also affect moral judgments due to high levels of emotional arousal (e.g., guilt). This study will aim to investigate how people with different levels of OC respond to moral stimuli, and whether OC is related to imagery and guilt. Both imagery and guilt have been implicated in processes of moral reasoning: this study will examine whether moral reasoning processes are qualitatively different in people with high levels of OC, before going on to consider constructs (imagery and guilt) that could account for this potential difference.

1.8.1 Study outline. This study aimed to explore processes of moral reasoning, moral emotions and imagery in people who are high and low in obsessive-compulsiveness (high/low OC). Participants were asked to complete an online survey consisting of questionnaires about mood, demographic information, OCD symptoms, guilt and cognitive style (visual vs. verbal). These participants were recruited from a non-clinical sample (students, social media and mental health charity forums). As OCD symptomatology is on a spectrum, it is justifiable to investigate novel individual differences in a non-clinical population to identify whether research with a clinical sample is warranted (Abramowitz et al., 2014). The study aimed to recruit at least 140 participants, half of which would meet the clinical cut-off for a diagnosis of OCD (a score of 21 on the Obsessive Compulsive Inventory – Revised; Foa et al., 2002) and half of which fall below this cut-off.

1.8.2 Study hypotheses. The hypotheses for the study were as follows:

- (1) 'People in the low-OC group will demonstrate an intention bias, people in the high-OC group will not do so.'
- (2) 'More frequent use of imagery will be associated with higher levels of OCD symptomatology, distress and guilt.'
- (3) 'State and trait guilt will mediate the relationship between imagery and OCD symptomatology.'

2 Method

This chapter sets out the characteristics of the sample, exclusion criteria and recruitment strategy, followed by a justification and description of the measures used. It goes on to describe the piloting procedure, full study procedure and pertinent ethical considerations.

2.1 Sample

221 participants completed an online survey between August 2016 and January 2017 (159 females, 39 males, three selected ‘other’ - defining themselves as ‘gender-queer or non-binary’ and four chose ‘prefer not to say’). The minimum age of the initial sample was 16 years and the maximum age was 65 ($M = 25.37$, $SD = 8.82$).

318 participants started the survey but did not complete it, giving an attrition rate of 59% (total number of participants who started the survey was 539). The progression of participants through the survey and implications of this high drop-out rate will be examined in further detail later in this chapter and in the discussion.

2.1.1 Exclusion criteria. Participants were not included in analyses if they were less than 18 years of age as the ability to make moral judgments varies considerably at different stages of development (e.g., Kohlberg & Kramer, 1969). Those completing the questionnaire were also asked to confirm they had a competent understanding of English as Christensen and Gomila (2012) state that it is necessary for participants responding to moral dilemmas to have a good conceptual understanding of the language the dilemmas are presented in. Finally, participants' responses to the moral dilemmas were checked; if they gave a nonsensical or unethical response their data were removed from the analyses (see Chapter 3). After applying these criteria, sixteen participants were removed from analyses (3 were below the age of 18, 13 gave strange responses to the moral dilemmas). All participants stated that they had a good working knowledge of the English language.

2.1.2 High-OC group. Previous research has shown that a cut-off score of 21 on the OCI-R is appropriate for differentiating between people with OCD symptoms and controls (Foa et al., 2002). For this reason, participants scoring 21 and over on the OCI-R were allocated to the ‘high-OC’ group. 72 participants met criteria for inclusion in the ‘high-OC’ group (52 females, 16 males, 3 ‘other’ and 1 selected ‘prefer not to say’). Participants’ age ranged from 18 to 50 years ($M = 23.07$, $SD = 5.70$).

2.1.3 Low-OC group. To be included in the ‘low-OC’ group, participants were required to score 20 or lower on the OCI-R (Foa et al., 2002). 133 participants met this criterion (107 females, 23 males and 3 who selected ‘prefer not to say’). Participants’ age ranged from 18 to 65 years ($M = 26.78$, $SD = 9.87$).

2.1.4 Power analysis. The original study investigating the intention principle conducted by Cushman, Young, and Hauser (2006) used similar methodology to that in the current study. In Cushman et al. (2006), participants were presented with vignette pairs detailing intentional harm vs. harm as a side-effect and paired sample t-tests were performed to determine whether subjects rated one scenario in the pair significantly more permissible than the other. Cushman et al. (2006) found statistically significant differences in all pairs and a small effect size ($d = .28$).

Using this small effect size ($d = .30$) as a guide, the recommended sample size for each group for a power level of .80 and an α of .05 is 70 (140 participants in total, 70 meeting criteria for the ‘high-OC’ group and 70 meeting criteria for the ‘low-OC’ group) in order to conduct a paired-samples t-test in line with Hypothesis 1 (Cohen, 1992a). Hypothesis 1 proposed that participants classified as ‘high-OC’ would not demonstrate an intention bias whereas those in the ‘low-OC’ group would demonstrate an intention bias (i.e., intentional harm would be judged as less acceptable than harm as a side-effect of an action).

In order to recruit 70 participants who met the criteria for the ‘high-OC’ group, recruitment continued beyond the target number of 140. To obtain the required number of participants scoring 21 or over on the OCI-R (Foa et al., 2002), 221 participants (who finished the survey) were recruited.

2.2 Recruitment

2.2.1 Recruitment strategy. To achieve the target sample size, participants were recruited from a number of different sources. These included the Royal Holloway participant pools (credit and prize draw), social media (Facebook, Twitter, Reddit), mental health websites (OCD-Action: <http://www.ocdaction.org.uk/help-us/research> and Student Minds: <http://www.studentminds.org.uk/research-studies.html>) and a website where researchers from a range of disciplines can advertise for participants (<https://www.callforparticipants.com>). All participants chose to take part voluntarily after viewing a brief description of the study (see Appendix A for an example).

To recruit participants via social media channels, careful consideration was given to guidance on the use of social media by clinical psychologists. This guidance recommends that practitioners maintain separate profiles for their professional and personal lives and clearly state the purpose of any professional pages designed for engagement with service users (BPS, 2012). As such, social media accounts dedicated to research recruitment were created on Facebook, Twitter and Reddit (for example screenshot see Appendix B). The BPS (2012) guidelines state that it is important to obtain appropriate permissions to post on public websites. On the Reddit website, the study was shared on the ‘Sample Size’ thread where researchers are permitted to post advertisements for research. In addition, the study was posted on the ‘OCD’ thread after permission was obtained from the moderator.

2.2.2 Incentives. Psychology undergraduates recruited from the Royal Holloway University participant pool received 3 course credits which were granted automatically by the system on survey completion. All other participants were invited to enter a prize draw to win one of four £25 Amazon vouchers by entering their email address at the end of the survey. Entry into the prize draw was optional so that participants were not required to provide their email address.

2.2.3 Sample drop-out. In a previous thesis study which used similar online methodology to investigate imagery in OCD, there was a high rate of attrition (45.72%; Trafford, 2016). In the current study, 539 participants started the survey, of which 221 completed it. Sixteen of these participants met the exclusion criteria and their data was subsequently excluded from analysis ($N = 205$). This meant that overall, there was an attrition rate of 59.6%. A review paper found that the drop-out from internet-based studies ranges from 2 to 83% ($M = 31\%$; Melville, Casey, & Kavanagh, 2010) meaning that the attrition in this study was particularly high. Of note, the majority of participants dropped out during the initial information, consent and demographic questionnaire pages, or during the Picture-Word task later on in the survey. See Figure 2.1 (below) for an overview of the points at which participants discontinued the survey. These findings will be considered in more detail in the discussion chapter.

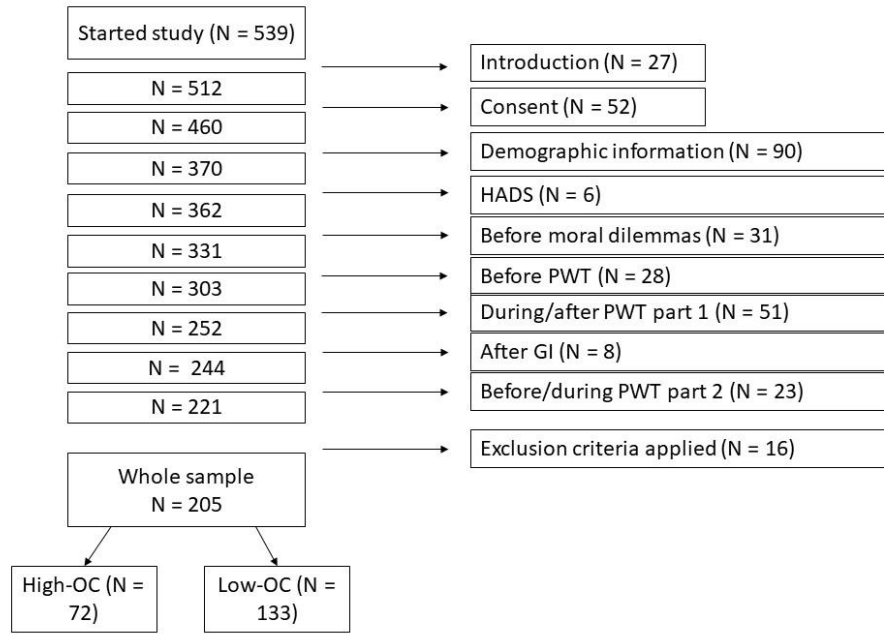


Figure 2.1. Participant attrition.

2.3 Measures

2.3.1 Demographic information. At the start of the study, participants were asked to complete a self-report questionnaire, which asked them to describe their gender, age, ethnicity, highest level of academic qualification achieved, religion, marital status and first language spoken (see Appendix C). They were given the option to answer ‘prefer not to say’ for any or all of these questions.

2.3.2 Measure of obsessive-compulsiveness. To accurately diagnose OCD, Antony, Orsillo, and Roemer (2002) advocate the use of a structured clinical interview such as the SCID-IV (First, Spitzer, Gibbon, & Williams, 1996) however as this study was web-based, it was not possible to conduct a clinical interview. A web-based methodology was selected as this had the potential to increase the sample size due to ease of access for participants. Researchers are increasingly recognising the utility of online studies and have found in a number of cases that results are comparable with those obtained from traditional methods (e.g., Baron & Siepmann, 2000; Kraut et al., 2004). For these reasons, this study used a self-report questionnaire to measure OCD symptoms.

Widely used self-report measures of OCD include the Maudsley Obsessive Compulsive Inventory (MOCI; Hodgson & Rachman, 1977), Yale-Brown Obsessive Compulsive Scale – Self-Report version (Y-BOCS-SR; Baer, 1991) and Obsessive Compulsive Inventory-Revised version (OCI-R; Foa et al., 2002). Abramowitz and Deacon (2006) found that the OCI-R assesses distress in relation to a broad range of symptoms, making it superior to the MOCI which does not include items measuring hoarding, ordering or symmetry.

The clinician-administered Y-BOCS was originally developed to measure severity of OCD symptoms rather than as a diagnostic tool (Goodman et al., 1989). The self-report version was developed to reduce the time and cost involved in assessing OCD symptoms (Baer, 1991), however it remains considerably longer than the OCI-R, at 68 items rather than 18. As the current study requires participants to complete a number of other measures, a shorter measure was considered an advantage.

The OCI-R has been validated in a non-clinical population and has demonstrated excellent internal consistency ($\alpha = .88$), good test-retest reliability (.70) and good convergent and divergent validity with other measures of anxiety and depression (Hajcak, Huppert, Simons,

& Foa, 2004). In a clinical population, the OCI-R has shown good internal consistency ($\alpha = .84$), convergent and discriminant validity (Huppert et al., 2007). It was originally used with a mixed sample of patients with OCD, other anxiety disorders, and non-anxious controls (Foa et al., 2002). As it demonstrates good psychometric properties across different samples and is a brief screening tool, the OCI-R was selected as an appropriate measure.

The OCI-R (see Appendix D) is an 18-item self-report questionnaire which asks participants to describe the extent to which symptoms of OCD have bothered them in the past month. They are required to rate their distress on a five-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). The possible range of scores is 0-72 with the mean score for someone with OCD 28.0 ($SD = 13.53$). A score of 21 or above is recommended as an indication of the presence of OCD (Foa et al., 2002).

Responsibility beliefs

In previous research (Franklin et al., 2009), responsibility beliefs have been linked with altered moral reasoning. Franklin et al. (2009) found that people with OCD scored significantly higher than the control group on the Responsibility Attitudes Scale (RAS; Salkovskis et al., 2000). Within the OCD group, there was a significant negative association between responsibility attitudes and utilitarian decisions: the more strongly people in the OCD group endorsed responsibility attitudes, the less likely they were to make a utilitarian decision. There was a similar pattern in the control group, however the association was not significant. This study showed that responsibility attitudes were associated with altered moral decision-making but only in clinical participants who were presented with a deontological vs. utilitarian choice. The Franklin et al. (2009) study was one of the first studies to investigate moral reasoning in OCD (in addition to Wroe & Salkovskis, 2000) and it remains unclear whether responsibility beliefs can be explicitly linked to general differences in moral

reasoning. As there is currently no definitive link between responsibility beliefs and altered moral-decision making, a measure of responsibility beliefs was not included in the current study. The possible implications of this will be considered further in the discussion section.

2.3.3 Measure of mood. As anxiety and depression have been shown to affect information processing and therefore decision-making, it was considered important to include a measure of mood in the current study. Beuke, Fischer, and McDowall (2003) assert that all research with a focus on negative emotion should measure both anxiety and depression, even if they are not the primary variables of interest.

There is considerable comorbidity between OCD, depression and other anxiety disorders (Adam, Meinlschmidt, Gloster, & Lieb, 2012). For example, Denys, Tenney, vanMegen, de Geus, and Westenberg (2004) found that major depressive disorder is up to ten times more prevalent in people with OCD than in the general population. In the case of anxiety disorders, it has been suggested that there is considerable conceptual overlap between generalised anxiety disorder and OCD in particular, as intrusive ‘worrying thoughts’ and compensatory behaviours function similarly to obsessions and subsequent compulsions (Comer, Kendall, Franklin, Hudson, & Pimentel, 2004).

The literature indicates that some of the outcome variables measured in this study (moral acceptability and imagery) may be influenced by levels of anxiety and depression, as well as OCD symptomatology. In a review paper, Holmes and Mathews (2010) stated that negative imagery is an important clinical feature of depression and anxiety disorders, in addition to OCD. Valdesolo and DeSteno (2006) also noted that people make different moral decisions as a result of positive mood induction. For these reasons, it was important to include a measure of anxiety and depression in addition to OCD symptoms.

The HADS was originally developed by Zigmond and Snaith (1983; see Appendix E). It consists of 14 items and is divided into two subscales, anxiety (HADS-A) and depression (HADS-D). The questionnaire alternates between questions relating to depression and anxiety. Participants are asked to rate each item on a scale between 0 and 3, where a higher value indicates greater severity of symptoms. A cut-off of 11 on the HADS-A and HADS-D scales indicates clinical caseness (Crawford, Henry, Crombie, & Taylor, 2001). The HADS has been used extensively in clinical practice; Bjelland, Dahl, Haug, and Neckelmann (2002) note that before the year 2000, 747 research papers had documented its use.

According to Bjelland et al. (2002), Cronbach's alpha for internal consistency varies from .68 to .93 ($M = .83$) for the HADS-A scale and from .67 to .90 for the HADS-D scale ($M = .82$). Nunnally and Bernstein (1994) state that a self-report instrument should have an alpha value of at least .60 to be judged reliable.

Previous research has shown that there is a moderate to strong correlation between the HADS-A and HADS-D subscales (.49 - .74; Mykletun et al., 2001). This is consistent with clinical evidence that depression and anxiety are highly co-morbid (Coplan, 2015). When examining concurrent validity, Bjelland et al. (2002) found that correlations between the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and HADS-D were from .62 to .73, BDI and HADS-A from .61 to .83, and BDI and HADS-total scale (HADS-T) were .73. Correlations between the Clinical Anxiety Scale (Snaith, Baugh, Clayden, Husain, & Sipple, 1982) and HADS-A ranged between .69 and .75 (Bjelland et al., 2002), whilst correlations between the State-Trait Anxiety Inventory (STAI; Spielberger, 1983) and HADS-A were .64 - .81, between STAI and HADS-D they were .52 - .65 and between STAI and HADS-T they were from .68 - .71 (Bjelland et al., 2002).

Overall, Mykletun et al. (2001) asserts that the HADS has good psychometric properties in terms of factor structure, intercorrelation and internal consistency, across a range of samples. The HADS has been validated for use in a number of different languages and in non-clinical and clinical populations (Snaith, 2003). Within OCD research, the HADS has been used both in clinical populations (e.g. Jacobsen, Freeman, & Salkovskis, 2012) and non-clinical or analogue samples (e.g. Lappalainen, 2012; Ólafsson et al., 2013).

2.3.4 Measure of guilt. Recent research has shown that guilt (Shapiro & Stewart, 2011), or the fear or experiencing guilt (e.g., D'Olimpio et al., 2013) may play an important part in maintaining obsessions and compulsions. An appropriate measure of guilt (The Guilt Inventory; Jones, Schratter, & Kugler, 2000) was therefore selected for inclusion in the study (see Appendix F).

A recent review of the literature on measuring guilt as a construct identified 29 different measures (Tilghman-Osborne, Cole, & Felton, 2010). Researchers in this field agree that 'guilt' has been conceptualised in a number of different ways. Jones et al. (2000) assert that three approaches are most common in the literature: 1. Measuring guilt as an affective state, 2. Measuring guilt as a trait or disposition, 3. Measuring guilt as a result of the strength of moral beliefs. The Guilt Inventory is a 45-item self-report questionnaire, consisting of three subscales which measure each of these domains: Trait Guilt, State Guilt and Moral Standards. Respondents are asked to answer using a five-point Likert scale, where (1) is strongly agree, (5) is strongly disagree and (3) is undecided. The items are coded so that a higher score means higher levels of trait and state guilt and more stringent moral standards.

The Guilt Inventory was developed by Kugler and Jones (1992). They reported that Cronbach's $\alpha = .81$, $.83$ and $.89$ for the Moral Standards, State Guilt and Trait Guilt subscales respectively, indicating good levels of internal consistency. In a student sample, they also

found good test-retest reliability for the Moral Standards ($r(134) = .84, p < .01$) and Trait Guilt subscales ($r(134) = .72, p < .01$). Test-retest reliability was lower on the State Guilt subscale ($r(134) = .56, p < .01$), however the authors argue that this would be expected, as ‘State Guilt’ is by definition a transient construct.

In the same sample, the researchers found that the Guilt Inventory demonstrated good concurrent validity, demonstrating strong correlations with a number of other scales, including the Mosher Guilt Inventory (Mosher, 1988) and Perceived Guilt Index – Trait and State subscales (Otterbacher & Munz, 1973).

2.3.5 Moral dilemmas. An ever-increasing number of researchers have used moral dilemmas to study underlying psychological processes in decision making (e.g., Cushman et al., 2006; Greene, Nystrom, Engell, Darley, & Cohen, 2004). Cushman and Greene (2012) propose that moral dilemmas should be conceptualised as experimental stimuli, which should be carefully designed to control for confounding variables. These potential confounding variables include: the personal relevance of the dilemma, a participant’s linguistic ability, word-framing effects, and perspective (i.e., whether participants are asked to imagine themselves as an observer or put themselves in a given situation; Christensen & Gomila, 2012). Christensen and Gomila (2012) also state that it is important to use vignettes that have been designed by ‘experts’ as they can then be assumed to be valid.

Another factor to consider is the level of threat or conflict described in moral dilemmas. Moore, Stevens, and Conway (2011) argue that the use of vignettes describing extreme situations allows more reliable conclusions to be drawn about underlying moral intuitions as people’s responses are likely to be magnified. Cushman et al. (2006) investigated the intention bias previously using ‘high-conflict’ dilemmas and found a small effect size. This

suggests that it would be necessary to use ‘high-conflict’ dilemmas to replicate this small effect size.

Taking into account the above considerations, the twelve vignettes previously used by Cushman et al. (2006) to investigate the intention bias were selected for use in the current study. The first author on the Cushman et al. (2006) paper was contacted by email and gave permission for the vignettes to be used in this study (F. Cushman, personal communication, March 14th, 2016).

In the Cushman et al. (2006) study, six vignette pairs (twelve vignettes in total) were used to investigate the intention bias (see Appendix G). Six of these vignettes describe harm that occurs directly as a result of an action taken by a protagonist, six describe harm that occurs as a side-effect of an action taken by a protagonist. The vignettes are paired such that each describes a scenario which is identical, apart from the way that harm occurs.

In addition to the six vignette pairs (Speedboat, burning, boxcar, switch, chemical, shark), two control vignettes were also included, as in Cushman et al. (2006). These control vignettes described a choice between lethal harm or a costless alternative. The rationale for including these control vignettes was to check whether participants were reading and understanding the scenarios they were presented with. If participants chose the lethal option, their responses were excluded from data analysis.

2.3.6 Visual analogue scales. Following each vignette, participants were presented with four questions which required an answer on a visual analogue scale. These questions asked:

1. How morally acceptable is this?
2. How distressed would you feel?

3. How responsible would you feel?

4. How guilty would you feel?

Participants were asked to answer on an eight-point Likert scale, where 0 was anchored by 'not at all' and 7 was anchored by 'extremely'.

To determine whether participants demonstrated an 'intention bias', their acceptability ratings were calculated and compared for the six vignettes detailing intentional harm and the six vignettes describing harm as a side-effect of an action.

2.3.7 Measure of imagery. To examine whether use of imagery is related to OCD symptomatology, distress and guilt, a measure of imagery was included in the study.

A number of self-report scales have been developed to measure use of imagery. The Spontaneous Use of Imagery Scale (Reisberg et al., 2003) is a twelve-item scale which asks participants to rate how often they engage in visual imagery in their everyday activities. More recently, the Plymouth Sensory Imagery Questionnaire was developed by Baugh et al. (2014). This is a 21-item questionnaire which asks participants to rate the vividness of imagery across different sensory modalities. Both of these scales show good internal reliability ($\alpha = .97$ and $.74$ respectively). However, these scales rely on self-report and recall of the use of imagery. Researchers have therefore sought to operationalise the use of imagery and measure cognitive style in the moment, rather than relying on recall.

Amit and Greene (2012) looked at moral judgments and whether the type of judgments people made were related to a visual or verbal cognitive style. They found that participants who preferred a visual processing style were more likely to make deontological judgments, and participants who preferred a verbal processing style were more likely to make utilitarian judgments. Amit and Greene (2012) used a computer-based working-memory task to classify participants as having either a visual or verbal cognitive style. It was not possible to use this

task in the current study as participants would be required to complete the task offline in addition to the online survey. The increased questionnaire/task burden would have had an adverse effect on the number of participants it was possible to recruit. For this reason, it was necessary to use a measure of imagery that could be completed as part of the online survey.

Picture-Word task

The Picture-Word task was originally devised by Holmes, Mathews, et al. (2008) to measure participants' tendency to use imagery or a verbal cognitive strategy. Participants were presented with a picture and word simultaneously and asked to combine the stimuli by creating a verbal representation or mental image. The task consisted of 20 pictures, each of which was presented with a positive, or negative word, giving a total of 40 picture-word pairs. The stimuli were presented to participants in a paper booklet. After each picture-word combination was presented, participants were asked to answer four questions:

1. How unpleasant/pleasant did you find the combination of this picture and word?
2. When you combined this picture with its word, how much did you find yourself thinking in mental imagery (i.e. in mental pictures, sensory impressions)?
3. When you combined this picture with its word, how much did you find yourself thinking in verbal thoughts?
4. To what extent did your picture-word combination feel as if you were experiencing it?

Each of these questions used 9-point Likert scales. For the first question, the numbers 1-9 were anchored by 1 (not at all) and 9 (extremely). For the second and third questions relating to style of thinking, the numbers 1-9 were anchored 1 (not at all) and 9 (all of the time) and for the final question, the numbers 1-9 were anchored by 1 (not at all) and 9 (a great deal).

Recently, the Picture-Word task has been adapted so that the length of time the stimuli are displayed for is held constant (Ji, personal communication, May 2015). To achieve this the task was set up in MATLAB; participants view a fixation cross for 1500ms, before the picture-word combination which is displayed for 3000ms.

In the current study, the Picture-Word task was adapted for use on the Qualtrics platform. The size of each picture was set to 600 x 500 pixels and a Javascript function was used to code the length of time the fixation cross and picture-word pair are displayed for.

Task outline

Consistent with previous use of the task (Ji, personal communication, May 5th, 2017) participants were initially presented with instructions for the task (see Appendix H), and an example of a picture-word pair and Likert-scale response questions. Following this example, participants were shown a practice trial which demonstrated the length of time the stimuli would be presented for.

After completing the practice trial, participants viewed 40 picture-word pairs in total (20 positive combinations and 20 negative combinations which were presented in a random order). There were 20 pictures in total, each of which was combined once with a negative word and once with a positive word such that each picture was viewed twice (see Appendix M for an example). Each picture-word combination was followed by four 9-point Likert-scale response questions (range 1-9; see Figure 2.2 below).

How UNPLEASANT/PLEASANT did you find the combination of this picture and word?	1 = VERY UNPLEASANT	2	3	4	5 = NEUTRAL	6	7	8	9 = VERY PLEASANT
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you COMBINED this picture with its word, how much did you find yourself thinking in MENTAL IMAGERY (i.e. in mental pictures, sensory impressions)?	1 = NOT AT ALL	2	3	4	5 = MODERATELY	6	7	8	9 = ALL OF THE TIME
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you COMBINED this picture with its word, how much did you find yourself thinking in VERBAL THOUGHTS (i.e. in words and sentences?)	1 = NOT AT ALL	2	3	4	5 = MODERATELY	6	7	8	9 = ALL OF THE TIME
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To what extent did your picture-word combination feel as if you were EXPERIENCING IT (i.e. that you were involved in it in some way)?	1 = NOT AT ALL	2	3	4	5 = MODERATELY	6	7	8	9 = A GREAT DEAL
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2.2. PWT Likert-scale response subscales.

Participants' answers to the second question (use of mental imagery) were summed to generate a score for participants' propensity to use imagery (range 20 – 180). For the purposes of exploratory analysis (see section 3.5.1), participants' answers for each of the four subscales ('pleasantness', 'imagery', 'verbal' and 'experiencing') were separated into positive or negative stimulus valence then summed.

2.4 Procedure

2.4.1 Pilot. The study was tested by a small sample of individuals from a non-clinical and student population (N = 4). They completed an initial draft of the survey and provided feedback as follows:

- One participant commented that the instructions for the Picture-Word task were not clear. In response to this, the instructions were amended and an additional example was provided before the task commenced.
- Another commented that the survey takes a considerable amount of time to complete. The survey was configured in Qualtrics so that it could be completed in sections. To maintain

participants' interest, measures were split up where possible and consideration was given to the order that measures were presented in.

2.4.2 Survey design. The survey was created on the Qualtrics platform (www.qualtrics.com) due to the functionality and security features available. See Table 2.1 below for an overview.

Table 2.1. Survey flow

Block Title	Description
Introduction/consent	Participants were presented with an introductory page, the information sheet (see Appendix I), consent form (see Appendix J), details about incentives and the ability to pause the survey in order to return to it at a later date.
Demographic information	A series of multiple choice or open-response questions, described previously in the measures section.
OCI-R and HADS	Participants were presented with the OCI-R and HADS on separate pages in table format.
Moral dilemma instructions	<p>Participants viewed the following instructions:</p> <p>“Please read the following passages carefully, then answer the questions below. Imagine you are the person described in each of the stories. You will see seven passages in total, each followed by four questions. The passages are separated by a horizontal line. Make sure you scroll down to the bottom of the page to complete this section.”</p>
Vignettes (first section)	Seven vignettes presented in a random order. One of these was a control vignette (option not to cause harm),

	three detailed intentional harm and three described harm as a side-effect of an action.
Practice picture-word task	Instructions for the task, an example and practice (timed) picture-word pair, followed by practice questions.
Picture-word task (first section)	Twenty picture-word stimuli (ten negative valence, ten positive) presented in a random order each followed by Likert-scale questions.
Guilt Inventory	Participants were presented with the Guilt Inventory in table format.
Vignettes (second section)	Seven vignettes presented in a random order. One of these was a control vignette (option not to cause harm), three detailed intentional harm and three described harm as a side-effect of an action.
Picture-word task (second section)	Twenty picture-word stimuli (ten negative valence, ten positive) presented in a random order each followed by Likert-scale questions.
Debrief	Participants presented with a 'thank-you' page, informing them they had finished the study, along with further information and the option to opt-in to a prize-draw.

2.4.3 Debrief. Following the final questionnaire, participants were presented with a page thanking them for their time and input, followed by an explanation of the purpose of the study (see Appendix L). Participants were given an option to provide their email address to opt into a prize draw and to obtain a copy of the results. They were provided with the contact details for the research team and given the option to download these, should they wish to contact the research team at a later date. Finally, participants were shown a page with details of agencies who would be able to provide support, if completing the questionnaires had raised any concerns.

2.5 Ethics

As this study recruited from mental health charities, students and the general population, ethical approval was applied for and granted through the Royal Holloway, University of London Ethics Committee (see Appendix K). Piloting and recruitment commenced after ethical approval had been granted.

In considering the ethical issues raised by this study a number of guidelines were referred to, including the British Psychological Society Code of Human Research Ethics (BPS, 2014), e-Professionalism guidance on the use of social media (BPS, 2012), and Ethics guidelines for internet-mediated research (BPS, 2013).

As this study was conducted online, it was important to consider the ethical issues raised by this. The BPS (2013) state that it is crucial to consider how to obtain valid consent online. Any consent procedures should be simple, sufficient clear information should be provided and it should be made clear that participants are able to withdraw their data. The present study provided a clear and succinct information sheet, followed by a consent page (as described above, see Appendix J). Participants were asked to select ‘yes’ or ‘no’ to provide consent, or close the browser window should they not wish to continue. If they did not select

a response, Qualtrics was set to prompt participants to answer so they did not skip past the consent page. Participants were provided with the contact details for the research team at the beginning and end of the survey and given the opportunity to download and keep these.

The study asks participants to respond to questions about mood and moral dilemmas. These questions had the potential to cause distress. Participants were informed that they were free to discontinue the survey at any point and provided with the contact details for agencies who could provide support (GP, NHS direct, Samaritans, Royal Holloway student counselling service, MIND, Emergency services). They were also encouraged to contact the research team should they have any questions or concerns.

To maintain anonymity, Qualtrics was set up to assign each participant a unique identification code. Any data downloaded from Qualtrics was stored in a password-protected file on an encrypted memory stick and accessed only by the research team. As participants were asked to provide their email address, which could potentially identify individuals, this information was stored separately from responses.

2.6 Analysis

At the end of recruitment, the data from the online survey were transferred directly from Qualtrics to SPSS (Version 21 for Windows), using the 'export' function. Statistical analyses are described in detail in the Results section which follows this chapter.

3 Results

3.1 Overview

This chapter describes the data screening procedure and statistical analyses that were conducted to test the study hypotheses. All data were analysed using IBM Statistics Software Version 21.0 (IBM Corporation, 2012). Alpha levels were set at $p < .05$ and exact significance levels are reported to two decimal places, with the exception of values less than $p = .01$, which are reported to three decimal places as appropriate. All numerical values are reported to two decimal places with the exception of those reported in the multiple mediation analysis which are reported to three decimal places to provide meaningful information.

3.2 Data screening

The initial data screening process followed the steps described in Tabachnick and Fidell (2001). Firstly, the data file was checked for accuracy using the SPSS 'Frequencies' function. All variables were found to be within their expected range, with plausible values for means and standard deviations. Any missing data were coded as '999' to assist with later analyses. Total scores were calculated for the OCI-R, HADS (anxiety, depression and total scale), Guilt Inventory (GI: moral standards, trait and state guilt subscales), moral dilemma response scales and Picture-Word Task (PWT) subscales.

Applying the exclusion criteria for the study, three participants' data were removed from the analyses as they reported they were under the age of 18. Responses to the control moral dilemma vignettes were also checked: if participants gave a nonsensical or unethical response their data were removed from the analysis, consistent with the methodology in Cushman et al. (2006). One participant answered 'unacceptable' on

the first control dilemma, twelve participants answered ‘extremely acceptable’ on the second control dilemma; their data were excluded from analyses, as their responses implied they had not paid attention to the vignettes. The total sample size after these criteria were applied was 205.

3.2.1 Missing data: continuous variables. Missing data can lead to a number of problems in analyses: a loss of statistical power, biased estimates and reduced generalisability (Kang, 2013). Missing data is particularly problematic when there is a non-random pattern of missing values (Tabachnick & Fidell, 2001). To examine the amount and distribution of missing data in the current dataset, a ‘Missing Completely at Random’ test (MCAR; Little, 1988) was conducted for all continuous variables. Results for continuous variables with missing data are shown in Table 3.2 below.

There were no missing data on the GI: trait guilt and state guilt subscales and the moral dilemma response scales.

Table 3.1

Little's MCAR test for continuous variables with missing data

Variable	Little's MCAR test statistic
HADS: Anxiety subscale (HADS-A)	$\chi^2(6) = 9.07, p = .17$
HADS: Depression subscale (HADS-D)	$\chi^2(12) = 9.94, p = .62$
HADS: Total scale	$\chi^2(39) = 46.18, p = .20$
OCI-R	$\chi^2(17) = 19.96, p = .28$
GI: Moral standards subscale	$\chi^2(14) = 10.35, p = .74$
PWT: Pleasantness subscale	$\chi^2(111) = 151.65, p = .006^*$
PWT: Imagery subscale	$\chi^2(111) = 133.42, p = .07$
PWT: Verbal subscale	$\chi^2(111) = 146.51, p = .01^*$
PWT: Experiencing subscale	$\chi^2(111) = 129.58, p = .11$

*Denotes significant result, indicating data not missing completely at random.

As is clear from Table 3.1, all missing values were determined to be MCAR, with the exception of the missing values on the PWT 'pleasantness' and 'verbal' subscales. On further inspection of the dataset, three cases were identified with missing values on these subscales.

According to Dong and Peng (2013), if data is not missing MCAR, the next step is to determine whether data are 'missing at random' (MAR). The recommended approach is to conduct a *t*-test to check whether 'missingness' is related to any other variables in the dataset (Dong & Peng, 2013; Tabachnick & Fidell, 2001). *T*-tests using a dummy variable to code cases with missing and non-missing values showed no significant differences on the OCI-R, GI, HADS, other PWT subscales or moral

dilemma responses. However, on inspection of the dataset, all missing values appeared during the second half of the survey, suggesting an attrition or boredom effect as participants became fatigued.

Schafer and Graham (2002) state that while it can be difficult to entirely prove the assumption of MAR, an erroneous assumption of MAR may only have a minor impact on estimates and standard errors. For this reason, it was decided to proceed with caution with the assumption that the missing data in the sample were MAR.

When data are assumed to be MAR, it is preferable wherever possible to use a method of dealing with missing data that preserves all cases for further analysis (Tabachnick & Fidell, 2001). It was therefore decided to use an imputation method to create values for missing data on continuous variables. Expectation Maximisation (EM; Dempster, Laird, & Rubin, 1977) was selected as this procedure produces realistic estimates of variance (Tabachnick & Fidell, 2001) and eliminates the need to delete cases or variables which would negatively impact statistical power. The EM algorithm was used on the HADS-A, HADS-D, OCI-R, GI: moral standards, and PWT (pleasant, imagery, verbal and experiencing subscales) variables to obtain a complete dataset for analysis.

3.2.2 Missing data: categorical variables. Two participants had missing data on the categorical variables within the dataset (one data point missing on ‘ethnicity’ and one missing on ‘marital status’). It is not possible to use the EM algorithm with categorical variables, so these data points were left as missing. These missing data points were treated with pairwise deletion, which allows the maximum amount of data to be retained (Pigott, 2001) as cases are only excluded from analyses requiring that specific variable (Schlomer, Bauman, & Card, 2010). There were no missing data points on ‘gender’, ‘age’, ‘religion’ or ‘first language’.

3.2.3 Normality of data. In order to conduct parametric tests, it is an assumption that data are normally distributed. To understand the shape of a distribution, the skewness (symmetry) and kurtosis (shape of the distribution’s peak) should be inspected (Tabachnick & Fidell, 2001).

Whole sample

In a large sample ($N > 200$), it is not necessary to calculate numerical values for skewness and kurtosis due to the small standard errors in a sample of this size (Field, 2009). Histograms with a normal curve were generated and inspected for each continuous variable, the conclusions from these are shown in Table 3.2 below.

With the exception of the HADS-A, GI subscales, PWT (imagery, verbal and experiencing subscales) and acceptability ratings for the vignettes, all distributions appeared to deviate from normal in the sample as a whole. Due to the large sample size, the potential impact of this deviation from normal is small (Tabachnick & Fidell, 2001).

Table 3.2

Skewness and kurtosis for continuous variables (N = 205)

Variable	Skewness	Kurtosis
Age	Positive	Normal
OCI-R	Positive	Normal
HADS-A	Normal	Normal
HADS-D	Positive	Normal
HADS-total	Positive	Normal
GI: State Guilt	Normal	Normal
GI: Moral Standards	Normal	Normal
GI: Trait Guilt	Normal	Normal
Picture-Word Task: pleasantness	Positive	Positive
Picture-Word Task: imagery	Normal	Normal
Picture-Word Task: verbal	Normal	Normal
Picture-Word Task: experiencing	Normal	Normal
Moral dilemmas: acceptability (intentional harm)	Normal	Normal
Moral dilemmas: acceptability (side-effect)	Normal	Normal
Moral dilemmas: distress (intentional harm)	Negative	Positive
Moral dilemmas: distress (side-effect)	Negative	Positive
Moral dilemmas: responsibility (intentional harm)	Negative	Positive
Moral dilemmas: responsibility (side-effect)	Negative	Positive
Moral dilemmas: guilt (intentional harm)	Negative	Positive
Moral dilemmas: guilt (side-effect)	Negative	Positive

Grouped data

As analyses would also be conducted with grouped data (high-OC and low-OC as categorised by a cut-off of 21 on the OCI-R), the normality of the data was inspected within each of these sub-groups (Tabachnick & Fidell, 2001). As these groups were smaller ($n = 72$, $n = 133$) for high- and low-OC respectively, numerical values for skewness and kurtosis were calculated, along with z -scores (Field, 2009). These z -scores are shown in Table 3.3 below. A cut-off value of 3.29 was used to define significant deviation from normality (Kim, 2013).

Table 3.3

Skewness and kurtosis values by group

	High-OC (n = 72)		Low-OC (n = 133)	
	Skewness	Kurtosis	Skewness	Kurtosis
Variable	z-score	z-score	z-score	z-score
Age	7.28*	3.57*	8.61*	2.85
OCI-R	2.59	-0.93	0.53	-1.46
HADS Anxiety scale	-0.62	-0.77	3.05	0.65
HADS Depression scale	2.45	0.49	6.76*	2.19
HADS total scale	0.97	-0.87	6.75*	1.41
GI State Guilt	-0.07	-1.21	-1.71	0.79
GI Moral Standards	0.15	0.54	2.22	1.11
GI Trait Guilt	0.89	-1.04	-0.20	-0.88
PWT pleasant	7.66*	3.23	-4.84*	3.43*
PWT imagery	-0.03	-0.80	-2.34	2.00
PWT verbal	-0.21	-0.95	0.53	0.71
PWT experiencing	-0.56	0.60	-0.64	0.78
Acceptability: intentional harm	-0.77	0.21	-0.17	-0.94
Acceptability: side-effect harm	-2.26	0.29	-1.24	0.11
Distress: intentional harm	-9.97*	4.40*	-7.68*	2.18
Distress: side-effect harm	-10.29*	4.51*	-6.26	1.36
Responsibility: intentional harm	-9.94*	4.48*	-7.53*	2.23
Responsibility: side-effect harm	-10.43*	4.82*	-7.21*	2.28
Guilt: intentional harm	-14.02*	6.22*	-8.86*	2.72
Guilt: side-effect harm	-12.28*	5.55*	-7.59*	2.19

*p < .05, denotes significant deviation from normality.

3.2.4 Outliers. Consideration was also given to univariate outliers, defined as data points which are significantly different from the rest of the data (Field, 2009). Outliers should be screened for as they can bias the mean and standard deviation statistics. To do this, z -scores were calculated for each continuous variable. Minimum and maximum z -scores for each variable are shown in Table 3.4 below.

As is clear from this table, outliers were identified both within the whole sample and the low- and high-OC groups on several variables.

Table 3.4

Standardised z-scores to detect outliers

	Low-OC (n = 133)		High-OC (n = 72)		Whole sample (N = 205)	
	Min.	Max.	Min.	Max.	Min.	Max.
Variable	z-score	z-score	z-score	z-score	z-score	z-score
Age	-.86	4.95*	-.90	3.90*	-.84	4.54*
OCI-R	-1.20	2.50	-1.90	2.12	-1.25	3.15
HADS-A	-2.54	1.99	-1.94	2.85	-1.91	2.51
HADS- D	-1.42	2.88	-1.09	3.68*	-1.23	3.35*
HADS-total	-1.98	2.64	-1.70	3.04	-1.78	3.08
GI: State Guilt	-1.88	2.09	-2.81	2.46	-2.48	2.39
GI: Moral Standards	-2.25	3.11	-2.64	3.11	-2.69	3.29
GI: Trait Guilt	-1.65	2.45	-2.61	2.18	-2.23	2.18
PWT: pleasant	-4.93*	2.69	-1.74	3.98	-3.79*	5.45*
PWT: imagery	-2.92	2.39	-1.99	2.59	-3.22	2.41
PWT: verbal	-2.05	2.69	-1.99	2.22	-2.05	2.53
PWT: experiencing	-2.60	2.72	-3.01	1.96	-2.71	2.36
Acceptability: intentional	-2.44	2.14	-2.28	2.13	-2.39	2.14
Acceptability: side- effect	-2.84	2.00	-2.51	1.93	-2.71	1.97
Distress: intentional	-3.42*	.70	-5.32*	.58	-5.59*	.65
Distress: side-effect	-3.16	.77	-5.38*	.56	-5.20*	.69
Responsibility: intentional	-3.59*	.77	.5.37*	.62	-4.06*	.71
Responsibility: side- effect	-3.97	.82	-5.60*	.62	-4.49*	.74
Guilt: intentional	-3.93	.71	-6.28*	.54	-4.54*	.64
Guilt: side-effect	-3.61*	.78	.5.96*	.56	-4.40*	.70

* $p < .05$, denotes significant deviation from normality.

3.2.5 Dealing with assumption violations. As is clear from the data-screening procedures described above, several variables were significantly different from normal and several outliers were identified. When data is significantly different from normal, Tabachnick and Fidell (2001) recommend transforming the data to deal with skewness, kurtosis and outliers unless there is a good reason not to do so.

Field (2009) states that the same transformation should be applied to all variables within a dataset wherever possible, to ensure that the relationships between variables are preserved. Square root, logarithmic and reciprocal transformations were run to test the effect on the problematic variables within the dataset. These transformations did not successfully bring the data within expected ranges for skewness and kurtosis.

As transforming the data was unsuccessful, the ‘bootstrap’ method was used as an alternative (Efron & Tibshirani, 1994). Bootstrapping works by taking repeated random samples from an existing dataset to create a number of ‘bootstrap’ samples which can then be used to approximate the sampling distribution of a statistic (Singh & Xie, 2008). The bias-corrected and accelerated bootstrap confidence interval (BCa) is proposed and recommended for general use, especially in cases in which the assumption of normality may be violated (Kelley, 2005). Efron (1984) recommends that the minimum number of bootstraps used in practice is 1000.

Kelley (2005) also recommends the BCa bootstrap method in cases where the sample size across groups is not equal, as is the case in the current study. The only assumption of the BCa approach is that the data are a random and representative sample drawn from a larger population. As there was no reason to assume that the outliers in the current dataset are not representative of the population (they all fall within expected ranges for each variable), all outliers were left in the dataset so that

bootstrapping would result in a representative sample. All subsequent parametric analyses reported in this chapter use the BCa bootstrapping method with 1000 bootstraps and confidence intervals set at 95%. When the range between the upper and lower level confidence intervals does not cross zero, statistical significance reaches the $p < .05$ level.

3.3 Group differences

To explore the data and check for confounding variables, any differences between the low- and high-OC groups were investigated. Sociodemographic variables included ‘age’, ‘gender’, ‘ethnicity’, ‘educational status’, ‘religion’, ‘marital status’, and ‘first language’. An independent *t*-test was conducted for ‘age’ as this is a continuous variable. As Levene’s test for homogeneity of variance was significant ($F = 11.15, p = .001$), results of this test are reported with correction for unequal variances.

For all other categorical variables, Chi-squared tests were used to check for group differences. Due to the small number of cases in some of the descriptive categories (e.g., ‘Other Asian’), categories have been grouped together to allow for meaningful interpretation of the results and to increase statistical power. Where the number of cases in a category was less than five, Fisher’s Exact Test (FET) is reported, as recommended by Field (2009). The results of these comparative tests are shown in Table 3.5.

As is clear from Table 3.5, there were no significant differences between the groups on ‘gender’, ‘ethnicity’, ‘religion’, ‘marital status’ and ‘first language’. However, there were significant differences between the high- and low-OC groups on ‘age’ and ‘education’. Previous research has shown that level of education does not affect people’s responses to moral dilemmas (Hauser et al., 2007), however age does affect

moral reasoning (e.g., Kohlberg & Kramer, 1969) so ‘age’ was controlled for wherever possible in further analyses.

Independent *t*-tests comparing the low- and high-OC groups were also conducted for all other variables of interest in the dataset. The results of these are reported in Table 3.6 below. Where Levene’s test showed that there were unequal variances, the appropriate corrected *t*-statistic is reported.

Table 3.5

Group comparisons for sociodemographic variables

Variable	Group			Test statistic
	Low-OC	High-OC	Total sample	
Age, <i>M</i> [SD]	27.19 [10.23]	22.72 [5.50]	25.62 [9.11]	$t(203) = 4.06, p < .001^*$, BCa CI: 2.30, 6.63
Gender, <i>n</i> (%)				
Male	23 (17.29)	16 (22.22)	39 (19.02)	$\chi^2 (2) = 2.49, p = .29$,
Female	107 (80.45)	52 (72.22)	159 (77.56)	$FET = 2.59, p = .26$
Other/prefer not to say	3 (2.26)	4 (5.56)	7 (3.41)	
Ethnicity, <i>n</i> (%)				
White British	98 (73.68)	54 (75.00)	152 (74.15)	$\chi^2 (2) = 1.68, p = .53$,
Not White British	31 (23.30)	18 (25.00)	49 (23.90)	$FET = 1.23, p = .65$
Prefer not to say/missing	4 (3.01)	0 (0.00)	4 (1.95)	
Education, <i>n</i> (%)				
No formal qualifications	0 (0.00)	3 (4.17)	3 (1.46)	$\chi^2 (4) = 21.03, p < .001^*$,
GCSE/BTEC	2 (1.51)	7 (9.72)	9 (4.39)	$FET = 19.60, p < .001^*$
A levels or equivalent	45 (33.83)	34 (47.22)	79 (38.54)	
Further education	79 (59.40)	27 (37.50)	106 (51.71)	
Prefer not to say/unsure	7 (5.26)	1 (1.39)	8 (3.90)	
Religion, <i>n</i> (%)				$\chi^2 (2) = 5.13, p = .08$,
No religion	83 (62.41)	37 (51.39)	120 (58.54)	$FET = 4.96, p = .08$
Religious	45 (33.83)	27 (37.50)	72 (35.12)	
Prefer not to say/unsure	5 (3.76)	8 (11.11)	13 (6.34)	
Marital status, <i>n</i> (%)				$\chi^2 (2) = 2.78, p = .28$,
Not with partner	81 (60.90)	51 (70.83)	132 (64.39)	$FET = 2.91, p = .23$
With partner	49 (36.84)	18 (25.00)	67 (32.68)	
Prefer not to say/missing	3 (2.26)	3 (4.17)	6 (2.93)	
First language				$\chi^2 (1) = 2.32, p = .13$
English	119 (89.47)	59 (81.94)	178 (86.83)	
Other	14 (10.53)	13 (18.06)	27 (13.17)	

* Denotes significant result; BCa CI = bootstrapped confidence interval, FET = Fisher's exact test

Table 3.6

Group comparisons for clinical variables

Variable	Group			Test statistic
	Low-OC	High-OC	Whole sample	
OCI, <i>M</i> [SD] ⁺	9.96 [4.73]	34.60 [11.36]	18.62 [14.08]	$t(85) = 21.79, p = .001^*$, Bca CI: -27.30, -22.02
HADS-A	6.89 [3.55]	13.11 [3.98]	9.07 [4.75]	$t(203) = 11.47, p = .001^*$, Bca CI: -7.30, -5.16
HADS-D	3.88 [3.57]	6.60 [3.95]	4.84 [3.92]	$t(203) = -5.01, p = .001^*$, Bca CI: -3.74, -1.68
HADS-total	10.77 [6.32]	19.70 [6.93]	13.91 [7.80]	$t(203) = -9.33, p = .001^*$, Bca CI: -10.82, -7.07
GI: State guilt ⁺	28.69 [5.51]	31.90 [3.37]	30.78 [4.51]	$t(126) = 7.17, p = .001^*$, Bca CI: 5.89, 10.44
GI: Moral standards	40.66 [7.83]	39.50 [6.91]	40.40 [5.32]	$t(203) = 1.06, p = .26$, Bca CI: -.97, 3.31
GI: Trait guilt	55.17 [9.43]	65.94 [7.42]	62.16 [9.65]	$t(203) = 7.58, p = .001^*$, Bca CI: 11.55, 19.90
PWT: pleasant ⁺	190.97 [20.46]	196.43 [36.37]	192.88 [27.17]	$t(96) = -1.38, p = .25$, Bca CI: -14.65, 3.31

Variable	Group			Test statistic
	Low-OC	High-OC	Whole sample	
PWT: imagery	215.92 [60.18]	236.17 [47.88]	223.03 [56.88]	$t(203) = -2.46, p = .01^*$, Bca CI: 35.57, -4.24
PWT: verbal	179.57 [67.15]	193.86 [72.89]	184.59 [69.38]	$t(203) = -1.41, p = .20$, Bca CI: -36.08, 7.44
PWT: experiencing	180.68 [54.18]	218.37 [53.94]	193.92 [56.89]	$t(203) = -4.76, p = .001^*$, Bca CI: -52.94, -22.28
Acceptability: intentional harm	22.36 [9.18]	21.69 [9.53]	22.13 [9.28]	$t(203) = .49, p = .62$, Bca CI: -2.01, 3.35
Acceptability: side-effect harm	24.65 [8.70]	23.71 [9.46]	24.32 [8.96]	$t(203) = .72, p = .48$, Bca CI: -1.67, 3.61
Distress: intentional harm	38.08 [5.58]	38.47 [6.11]	38.22 [5.76]	$t(203) = -.46, p = .67$, Bca CI: -2.11, 1.45
Distress: side-effect harm	37.32 [6.10]	38.60 [6.07]	37.78 [6.11]	$t(203) = -1.44, p = .15$, Bca CI: -3.15, .50
Responsibility: intentional harm ⁺	35.09 [8.95]	38.29 [6.01]	36.21 [8.17]	$t(194) = -30.05, p = .006^*$, Bca CI: -5.24, -1.06
Responsibility: side-effect harm ⁺	34.78 [8.77]	38.39 [5.78]	36.05 [8.02]	$t(195) = -3.54, p = .002^*$, Bca CI: -5.65, -1.60
Guilt: intentional harm ⁺	35.76 [8.84]	38.69 [6.16]	36.79 [8.11]	$t(190) = -2.78, p = .01^*$, Bca CI: -4.99, -.74
Guilt: side-effect harm ⁺	35.09 [8.88]	38.38 [6.44]	36.24 [8.24]	$t(186) = -3.04, p = .005^*$, Bca CI: -5.47, -1.22

*Denotes significant result

⁺T-statistic corrected for unequal variances.

Bootstrapped confidence intervals are provided.

As is clear from Table 3.6, significant differences were found between groups on the OCI-R, HADS-A, HADS-D, HADS-total, GI: state guilt, GI: trait guilt, PWT: imagery, PWT: experiencing, Responsibility: intentional harm, Responsibility: side-effect harm, Guilt: intentional harm, and Guilt: side-effect harm variables. The result on the OCI-R demonstrates the expected difference between the low- and high-OC groups.

3.4 Hypothesis 1

‘People in the low-OC group will demonstrate an intention bias, people in the high-OC group will not do so.’

To test this hypothesis, analyses were conducted to replicate the methodology used in Cushman et al. (2006). It should be noted that it was not possible to consider age as a covariate in these analyses.

3.4.1 Paired sample *t*-tests. Analyses were conducted to examine the presence of an intention bias in the low- and high-OC groups. The ‘moral acceptability’ ratings for vignettes describing intentional harm and harm as a side-effect were compared, as in Cushman et al. (2006). The independent variable entered in this analysis was ‘OCD-group’ and the dependent variable ‘acceptability’ rating.

In the low-OC group, a paired samples *t*-test showed that participants judged harm as a side-effect ($M = 24.65$, $SD = 8.70$, BCa CI: 23.08, 26.15) to be significantly more acceptable than intentional harm ($M = 22.36$, $SD = 9.18$, BCa CI: 20.70, 23.98; $t(132) = -7.50$, $p < .001$). This result demonstrates the presence of an intention bias in the low-OC group.

In the high-OC group, a paired samples *t*-test showed that participants judged harm as a side-effect ($M = 23.71$, $SD = 9.46$, BCa CI: 21.53, 25.75) to be significantly more acceptable than intentional harm ($M = 21.69$, $SD = 9.53$, BCa CI: 19.63, 23.78; $t(71) = -4.81$, $p < .001$). This result demonstrates the presence of an intention bias in the high-OC group.

3.4.2 Summary. The presence of the intention bias was demonstrated in both the low- and high-OC groups, indicating that Hypothesis 1 was not supported. The implications of this will be discussed in more detail in the Discussion chapter.

3.5 Hypothesis 2

'More frequent use of imagery will be associated with higher levels of OCD symptomatology, distress and guilt.'

To test this hypothesis, Pearson correlations were conducted to explore the relationship between participants' total score on the OCI-R (OCI total), GI: state guilt, GI: trait guilt, PWT: imagery, vignettes: distress, and vignettes: guilt. As three measures of guilt were included, Bonferroni correction was applied to reduce the chance of a Type I error (Field, 2009) such that the corrected confidence level for measures of guilt was $p = .02$. Results are shown in Table 3.7 below. Bootstrapped confidence intervals confirmed the findings reported in Table 3.7.

Table 3.7

Correlation matrix showing Pearson's r for OCI-R, PWT, GI and vignette responses

Variable	1	2	3	4	5
1. OCI total	—				
2. PWT: imagery	.19**	—			
3. GI: state guilt	.50**	.17*	—		
4. GI: trait guilt	.51**	.17*	.79**	—	
5. Vignettes: distress	.02	.15*	.04	.13	—
6. Vignettes: guilt	.14	.14	.08	.15*	.80**

* $p < .05$, ** $p < .01$

Table 3.7 shows that there was a significant positive correlation between OCD symptomatology (as measured on the OCI-R), state and trait guilt (measured on the GI) as expected. There was also a significant positive correlation between OCD symptomatology and use of imagery (measured on the PWT), indicating that more frequent use of imagery was associated with a higher level of OCD symptomatology, however it should be noted that this correlation was smaller in size. There were no significant associations between OCD symptomatology and reported levels of distress and guilt in response to the vignettes. These results partially support Hypothesis 2 as OCD symptomatology was associated with state guilt, trait guilt and use of imagery. These findings will be discussed further in the following chapter.

It is also evident from Table 3.7 that there were significant positive correlations between use of imagery, state guilt, trait guilt and distress in response to the vignettes. State and trait guilt were significantly positively correlated with each other and higher levels of trait guilt were associated with a higher level of guilt in response to the vignettes. Finally, distress in response to the vignettes showed a significant positive correlation with guilt in response to the vignettes.

3.5.1 PWT: exploratory analyses. In addition to measuring imagery, the PWT also measures propensity to think verbally, the extent to which the image or sentence produced was ‘pleasant’ and the extent to which the image or sentence was ‘experienced’ (see Section 2.3.7). Descriptive data for each of the PWT subscales are presented in Table 3.8 below. For comparison purposes, the data for each subscale are provided by stimulus valence (positive or negative).

Table 3.8

Descriptive statistics for PWT

Variable	Minimum	Maximum	<i>M</i> [SD]
PWT: Imagery (positive)	20	180	111.88 [28.25]
PWT: Imagery (negative)	20	180	111.16 [29.56]
PWT: Verbal (positive)	20	180	92.19 [34.86]
PWT: Verbal (negative)	20	180	92.40 [35.20]
PWT: Pleasantness (positive)	55	169	97.12 [14.44]
PWT: Pleasantness (negative)	34	172	95.77 [14.10]
PWT: Experiencing (positive)	20	180	97.79 [28.83]
PWT: Experiencing (negative)	20	164	96.12 [28.96]

To check whether PWT stimulus valence (positive or negative) was related to level of OCD symptomatology and guilt, Pearson correlations were conducted between each of the PWT subscales, OCI-R total scores, GI: state and trait guilt, and vignettes: guilt. As previously, Bonferroni correction was applied to reduce the chance of a Type I error (Field, 2009) such that the corrected confidence level for measures of

guilt was $p = .02$. The results of these analyses are shown in Table 3.9 below.

Bootstrapped confidence intervals confirmed the findings reported in Table 3.9.

Of note, Table 3.9 (below) shows that:

(1) There were large significant positive correlations ($> .6$; Cohen, 1992a) between participants' responses to *positive* and *negative* picture-word pairs. This was the case for each of the PWT subscales (Imagery, Verbal, Pleasantness and Experiencing).

(2) There was a significant positive correlation between participants' propensity to use imagery in response to *positive* picture-word pairs, and their scores on the OCI-R ($p = .01$), however it should be noted that these correlations were small.

(3) There were significant positive correlations between participants' propensity to use imagery in response to *negative* picture-word pairs and their scores on the OCI-R, GI: state guilt and GI: trait guilt ($p < .01$ for each construct). As previously, it should be noted that these correlations were small.

(4) Participants' propensity to use a verbal strategy in response to both *positive* and *negative* picture-word pairs, was significantly positively associated with scores on the OCI-R ($p < .05$) but not with GI: state or trait guilt.

(5) Participants' 'pleasantness' and 'experiencing' ratings showed a significant positive correlation with their scores on the OCI-R for both *positive* and *negative* picture-word pairs. In the case of the 'experiencing' subscale, these correlations were moderate (.33 and .35 respectively), whilst they were small ($< .2$) in the case of the 'pleasantness' subscale. Participants' 'experiencing' ratings also showed a significant positive correlation ($p < .001$) with their scores on the GI: state guilt and trait guilt subscales, for both *positive* and *negative* picture-word pairs.

Table 3.9

Correlation matrix showing Pearson's r for PWT (positive and negative valence), OCI-R, GI and vignette responses: guilt

Variable	1	2	3	4	5	6	7	8	9	10	11
1. PWT: Imagery (positive)	—										
2. PWT: Imagery (negative)	.94**	—									
3. PWT: Verbal (positive)	-.03	-.03	—								
4. PWT: Verbal (negative)	-.01	-.04	.96**	—							
5. PWT: Pleasantness (positive)	.31**	.29**	.19**	.19**	—						
6. PWT: Pleasantness (negative)	.31**	.31**	.18*	.20**	.81**	—					
7. PWT: Experiencing (positive)	.66**	.60**	.22**	.22**	.34**	.35**	—				
8. PWT: Experiencing (negative)	.64**	.64**	.22**	.23**	.33**	.38**	.94**	—			
9. OCI-R (total)	.18*	.20**	.14*	.14*	.16*	.18*	.33**	.35**	—		
10. GI: state guilt	.13	.19**	-.02	-.03	.03	.05	.23**	.25**	.50**	—	
11. GI: trait guilt	.15*	.19**	.01	.01	.00	.03	.26**	.29**	.51**	.79**	—
12. Vignettes: guilt	.15	.12	-.02	-.02	.04	.06	.16	.14	.14	.08	.15

* $p < .05$, ** $p < .01$

3.6 Hypothesis 3

‘State and trait guilt will mediate the relationship between imagery and OCD symptomatology’.

A multiple mediation analysis (Hayes, 2013) was conducted to explore whether the relationship between imagery and OCD symptomatology was mediated by different types of guilt, as measured by scores on the GI: trait and state guilt subscales.

3.6.1 Data screening. In addition to the data screening procedures described earlier in this chapter, Hayes (2013) recommends checking that constructs entered into the model are not highly correlated with each other (multicollinearity). If this is the case, it becomes difficult to tell which potential mediator variables are important. For this reason, variables were screened for multicollinearity in the planned multiple mediation analysis.

Field (2009) advocates a thorough approach to checking for multicollinearity, examining the variance inflation factor (VIF), which indicates whether variables have a strong linear relationship. According to Myers (1990, as cited in Field, 2009) a VIF greater than 10 indicates potential problems with multicollinearity. Menard (1995) also recommends examining the tolerance statistic ($1/\text{VIF}$) and suggests that any value less than .2 could indicate concern; however, Field (2009) advocates using a stricter tolerance statistic of .1. If the average VIF value is substantially greater than 1, this could also indicate potential bias in a regression model as a result of multicollinearity (Bowerman & O’Connell, 1990).

Using these recommendations: VIF values for potential mediator variables (trait and state guilt) and the independent variable (use of imagery) were all less than 3,

tolerance statistics were all greater than .1 and the average VIF value was 2.14. These results all indicate no serious problems with multicollinearity.

3.6.2 Multiple mediation analysis. A multiple mediation approach was adopted as suggested by Preacher and Hayes (2008), who view using a single multiple mediation model as preferable to several simple models. When several simple mediation models are conducted simultaneously, these models may suffer from the ‘omitted variable problem’ which can lead to biased parameter estimates (Judd & Kenny, 1981). Additionally, including all potential mediators in the model allows competing theories to be “pitted against each other” (Hayes, 2009, p. 415). It is then possible to draw conclusions about the extent to which the set of mediators have an effect, when the influence of other mediators is taken into account.

Several methods have been proposed for testing hypotheses about mediation, however it has recently been suggested that the bootstrap method is preferred over the more traditional causal steps approach (Baron & Kenny, 1986, as cited in MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). This approach does not require the assumption of normality to be satisfied and has greater statistical power (Preacher & Hayes, 2008). Preacher and Hayes (2008) advise using 5000 bootstrap samples wherever possible, and this approach was adopted in the current study.

According to Preacher and Hayes (2008), mediation occurs when it can be shown that a predictor variable (X) affects an outcome variable (Y) indirectly through one or more mediator variables (M). Complete mediation occurs when variable X no longer affects Y after the effect of M has been taken into account. A partial mediation relationship exists when the indirect effect of X through M on Y reduces the size of the direct relationship between X and Y. In other words, mediation occurs when the

direct relationship between X and Y (path c') is either partially or totally accounted for by the indirect relationship between X and Y through M (paths a and b; see Figure 3.2).

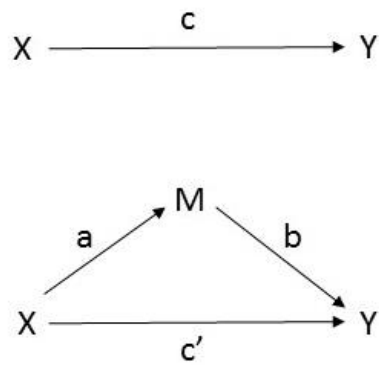


Figure 3.1. Simple mediation diagram

A multiple mediation analysis was conducted using the PROCESS macro V2.16 (Model 4) for SPSS (Hayes, 2013). State and trait guilt (measured on the GI) were entered simultaneously into the model as potential mediators between imagery (measured on the PWT) and OCD symptomatology (measured on the OCI-R), whilst controlling for age as in previous analyses.

A visual representation of the multiple mediation model is shown in Figure 3.3 below, along with the regression coefficients and corresponding significance values for each path.

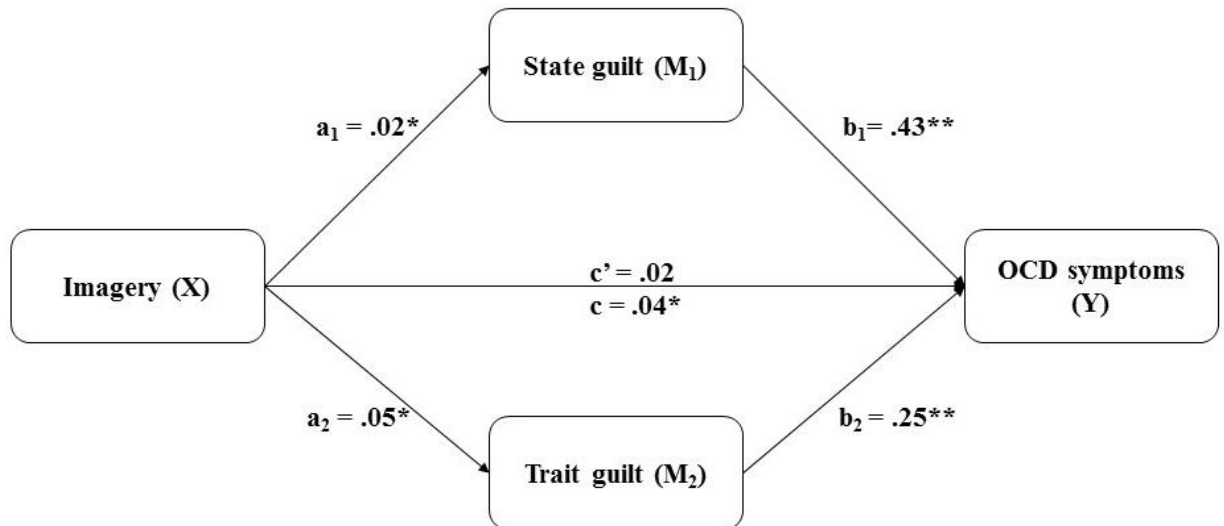


Figure 3.2. Multiple mediation analysis of the effect of imagery on OCD symptoms, mediated by guilt (significant regression coefficients: $*p < .05$, $**p < .01$).

3.6.3 Direct effects. Table 3.10 shows the results for regression coefficients, standard errors and significance values, for the relationship between imagery (X) and mediators (M_1 and M_2), the relationship between mediators (M_1 and M_2) and OCD symptomatology (Y) and the direct effect between imagery (X) and OCD symptomatology (Y). As is clear from the table, the paths between imagery and state/trait guilt (paths a_1 and a_2 on Figure 3.2) are significant. The paths between state/trait guilt and OCD symptomatology are significant (paths b_1 and b_2 on Figure 3.3). Finally, the direct effect of imagery on OCD symptomatology is also significant (path c on Figure 3.3). Bootstrapped confidence intervals also confirmed that all paths were significant.

Table 3.10

Results of multiple mediation analysis (direct effects)

Antecedent	Consequent								
	OCI-R: OCD symptomatology (Y)			GI: state guilt (M ₁)			GI: trait guilt (M ₂)		
	b	SE	p	b	SE	p	b	SE	p
Age	-.25	.09	.007**	.05	.06	.42	.17	.12	.15
PWT: imagery (X)	.04	.02	.01*	.02	.01	.02*	.05	.02	.02*
GI: state guilt (M1)	.43	.16	.009**	-	-	-	-	-	-
GI: trait guilt (M2)	.25	.09	.004**	-	-	-	-	-	-
Regression model	$R^2 = .03$			$R^2 = .04$			$R^2 = .08$		
	$F(2,202) = 3.20, p = .04^*$			$F(2, 202) = 4.20, p = .02^*$			$F(2, 202) = 8.31, p < .001^{***}$		

* $p < .05$, ** $p < .01$, *** $p < .001$

The regression coefficients detailed in Table 3.10 (above) indicate that:

- (1) More frequent use of imagery was associated with higher scores on the trait and state guilt subscales.
- (2) Higher scores on the trait and state guilt subscales were associated with higher levels of OCD symptomatology.
- (3) More frequent use of imagery predicted higher levels of OCD symptomatology.

3.6.4 Indirect effects. To test the mediation hypothesis, the indirect effect of imagery (X) on OCD symptomatology (Y) through trait and state guilt (M_1 and M_2) was explored. Confirming the mediation hypothesis, the path between imagery and OCD symptomatology was no longer significant when the effects of trait and state guilt were taken into account (path c' on Figure 3.2, $b = .02$, $SE = .01$, $p = .14$). This indicates partial mediation, as the direct relationship between imagery and OCD symptomatology reduced in size when state and trait guilt were entered into the model as mediator variables. Taken together, state and trait guilt were significant mediators of the relationship between imagery and OCD symptomatology, as shown by bootstrapped confidence intervals which do not cross zero (see Table 3.11). Trait and state guilt together accounted for approximately 22% of the total effect. When considered separately, state and trait guilt accounted for 10 and 12% of the total effect, respectively.

Table 3.11

Indirect effects of mediators

	Effect	SE	BCa CI [LCI, UCI]
Total	.022	.008	.007, .039
Mediator			
State guilt	.010	.005	.003, .023
Trait guilt	.012	.006	.003, .026

These findings suggest that Hypothesis 3 was supported, as state and trait guilt partially mediated the relationship between use of imagery and OCD symptomatology. The implications of this will be discussed in detail in the following chapter.

4 Discussion

4.1 Overview

In this final chapter, the aims and findings of the study are summarised then discussed in the context of the existing literature. The theoretical implications of the main findings are considered, followed by an outline of the strengths and limitations of the research. Finally, potential avenues for future research and the clinical implications of the study are explored, before the chapter closes with concluding remarks.

4.2 Aims

This study aimed to investigate moral reasoning (the intention bias), guilt and imagery in people with OCD. The main hypotheses were as follows:

- (1) Firstly, the study investigated the ‘intention bias’, as described in Cushman, Young, and Hauser (2006). The moral principle that intentional harm is less acceptable than harm which is a side-effect of an action has been widely documented in the general population (e.g., Cushman, 2015), however this principle has not previously been investigated in people with OCD. Based on findings relating to a similar moral principle (the omission bias; Franklin et al., 2009; Wroe & Salkovskis, 2000), this study proposed that people in the high-OC group (according to a clinical cut-off of >21 on the OCI-R; Foa et al., 2002) would have higher moral standards than people in the low-OC group (<21 on the OCI-R).

It was expected that the inflated sense of responsibility, ‘thought-action fusion’ and fear of guilt found in people with OCD would affect the moral decisions that they make, meaning they would be less likely to view harm as acceptable, whether this harm was intentional or not. It was therefore proposed

that people in the high-OC group would be less likely to demonstrate an intention bias, as they would universally view any type of harm as unacceptable.

- (2) Secondly, the study aimed to explore moral emotion in OCD: whether high levels of distress and guilt are associated with a high level of OCD symptomatology and more frequent use of imagery. It is well known that people with OCD experience intrusive imagery and that imagery is associated with high levels of emotional arousal (Holmes & Mathews, 2010; Holmes, Mathews, et al., 2008). For this reason, it was proposed that frequent use of imagery (measured on the PWT) would be positively correlated with levels of guilt (state and trait), distress and OCD symptomatology.
- (3) Finally, the association between imagery and OCD was explored. As previously mentioned, the experience of imagery is linked with high levels of emotional arousal. The intrusive images experienced in OCD lead to strong negative emotions such as distress, anxiety and guilt which can lead to compensatory behaviour. However, whilst guilt has been suggested to be a key maintaining factor in OCD, it remains unclear exactly how guilt is implicated. A recent meta-analysis suggested that state and trait guilt may be important constructs which are linked with a poorer treatment outcome, although the evidence remains equivocal (Shapiro & Stewart, 2011). There is clear evidence however, that an increase in guilty feelings leads to an increase in OCD-like behaviour (D'Olimpio et al., 2013).

In summary, the experience of intrusive imagery and the resulting emotional response (guilt) could contribute to the development and maintenance of OCD symptomatology. It was proposed that when intrusive images occur, guilt

(state and trait) would mediate the relationship between intrusive images and OCD symptomatology.

To explore these hypotheses, participants in the study were asked to complete an online survey consisting of a battery of questionnaires, moral dilemmas and a visual/verbal task to classify their cognitive style.

4.3 Hypothesis 1 – main findings and theoretical implications

‘People in the low-OC group will demonstrate an intention bias, people in the high-OC group will not do so.’

The results of the analyses did not support this hypothesis, as *t*-tests which replicated the methodology used in Cushman et al. (2006) showed the presence of the intention bias in both the low- and high-OC groups. Participants in both groups demonstrated an intention bias in the moral judgments they made, consistently indicating across vignettes that intentional harm was less morally acceptable than harm as a side-effect of an action. The results of these analyses will be explored in relation to the relevant moral philosophy and experimental psychology literature.

4.3.1 Universal moral grammar. The intention bias was found to exist in both the low- and high-OC groups, which is consistent with the assertion that the intention bias is “one of the oldest, best-documented and most reliable findings in the field of moral psychology” (Cushman, 2015, p. 97). Viewing intentional harm as morally worse than harm as the side effect of an action may be a universal intuitive principle (Mikhail, 2009). This would be consistent with the idea of a ‘universal moral grammar’, which suggests that individuals have unconscious knowledge of moral principles, consistent across culture, social class and time (e.g., Bartels, Bauman, Cushman, Pizarro, & McGraw, 2014). Although the content of moral beliefs varies, the concepts of ‘right’ and ‘wrong’ seem to be a constant in most cultures. In this study, the notion of universal moral principles was supported by the finding that both the low- and high-OC groups rated intentional harm as worse than harm as the side-effect of an action. However, these findings were inconsistent with the expected findings set out in Hypothesis 1 and potential reasons for this will now be explored.

In Cushman et al. (2006), the original study exploring three well-known moral principles, the researchers found that when participants were asked to justify the moral decisions they had made, they were able to explain their reasoning in the case of the ‘action principle’ but they could not do so in the case of the ‘contact’ or ‘intention principle’. This implies that moral decisions which are consistent with the intention bias are made “without any conscious awareness of having gone through steps of searching, weighing, evidence, or inferring a conclusion” (Haidt, 1995, p. 818). In a follow-up study on the intention bias, Hauser, Cushman, Young, Kang-Xing Jin, and Mikhail (2007) found that moral judgments were unaffected by the level of participants’ education. This provides further evidence that the intention bias may

be a universal principle which is not affected by conscious reasoning. If judgments of intention are intuitive, they may be universal and unaffected by OCD symptomatology.

4.3.2 Dual-process model of morality. It is well documented that people experience a strong negative emotional reaction when confronted with the possibility of causing harm to other people (Cushman, Gray, Gaffey, & Mendes, 2012). If this reaction is very powerful, or if people do not have the time (Suter & Hertwig, 2011), motivation or cognitive resources (Amit & Greene, 2012) to consider their decision, people are likely to make an automatic deontological decision that harm is unacceptable, regardless of how this harm occurs. However, if there are cognitive resources available, people are more likely to take their time and make a considered utilitarian decision which takes other factors into account. This is consistent with the dual-process model of morality which proposes that fast, automatic processing preferentially supports deontological judgments, whereas slower, cognitive processing preferentially supports utilitarian judgments (e.g., Greene et al., 2001).

In the current study, people were given unlimited time to consider their responses to the moral dilemmas they were presented with. This could mean that participants in both the low- and high-OC groups made more utilitarian decisions as they had the cognitive resources available to do so. The intention bias is consistent with a utilitarian framework and this might explain why both groups made judgments in line with this principle. It would have been interesting to investigate whether, if a time limit had been imposed on participants, people with OCD responded with more deontological decisions due to potentially stronger emotional responses to harm.

Under time pressure, these strong emotional responses to harm would be difficult to override and the expected difference between groups could have emerged.

Alternatively, Greene et al. (2001) found that when people considered impersonal moral dilemmas in which victims were ‘distant’, regions of the brain associated with cognitive reasoning were more active. If potential victims of harm are ‘distant’, then levels of emotional arousal are low and participants make more utilitarian choices (Carmona-Perera et al., 2013). The moral dilemmas given to participants in the current study described scenarios which participants were unlikely to come across in everyday life, meaning they may have had a minimal level of emotional response. If participants were able to psychologically distance themselves from the moral dilemmas which were presented, they would have been more able to engage in detailed cognitive processing (Trope & Liberman, 2010). As previously mentioned, this would mean that participants were more likely to make utilitarian decisions, consistent with the intention bias. This would be the case for the both the low- and high-OC groups, accounting for the lack of difference found between the groups.

4.3.3 Responsibility appraisals and guilt. If participants were able to psychologically distance themselves from the moral dilemmas they were given, this could also imply that they did not feel responsible for the harm which was described in the scenarios. Mancini and Gangemi (2011) found that people were less concerned about a potentially harmful event if they believed they were not responsible for a negative outcome. If they were not responsible for a negative outcome, then a fear of potential guilt was also reduced. Whilst people with OCD typically believe themselves to be more responsible for preventing harm than the general population (Arntz, Voncken, & Goosen, 2007), this may only be the case when a scenario is related to OCD-like concerns. In previous studies, researchers found that in the case of the omission bias, people with OCD made stricter moral decisions but only when presented with scenarios that were OCD-relevant (Siev et al., 2010; Wroe & Salkovskis, 2000). In the current study, the scenarios given were not relevant to typical OCD concerns, which could explain the lack of difference in the moral decisions made by the low- and high-OC groups.

4.3.4 Thought-action fusion, agency and intent. It has been proposed that people with OCD view intrusive thoughts about harm as the moral equivalent of harm which happens in reality (Salkovskis et al., 1995). The concept of ‘thought-action fusion’ means that for some people with OCD, thinking about harmful events increases the perceived likelihood that they will happen (Shafran, Thordarson, et al., 1996). For this reason, it has been argued that people with OCD might feel less free or in control of their actions (Oren et al., 2016). If people with OCD believe that harm is their fault and inevitable, they might judge all harm as unacceptable. Just having a morally unacceptable thought could be sufficient for someone with OCD to think that a negative outcome is their fault, regardless of whether this outcome occurs as a direct result or as a side-effect of an action. People with OCD might have a different understanding of ‘intention’, meaning that they do not display the intention bias found in the general population.

However, as previously mentioned, in the current study this was not the case; people in the low- and high-OC groups both evaluated intentional harm as morally worse than harm as the side-effect of an action. It may be that people with a high level of OCD symptoms (> 21 on OCI-R; Foa et al., 2002) make judgments of intention which are similar to the judgments of intention found in the general population. Malle, Guglielmo, and Monroe (2014) proposed that when people make judgments of intention or blame, they ask whether people had the ‘capacity’ to prevent a bad outcome. In the case of this study, the options to prevent a bad outcome were clearly described and contrasted in each of the scenarios and it appears that people in the high-OC group were also able to appreciate this difference.

4.4 Hypothesis 2 – main findings and theoretical implications

‘More frequent use of imagery will be associated with higher levels of OCD symptomatology, distress and guilt’.

This hypothesis was partially supported by the results of the analyses as there were significant positive correlations between imagery, state guilt, trait guilt and OCD symptomatology. These correlations were small when imagery was associated with state and trait guilt (.17) and small when use of imagery was associated with OCD symptomatology (.19; Cohen, 1992). There was a large significant positive correlation between both state and trait guilt and OCD symptomatology (.50 and .51, respectively). However, imagery was not significantly associated with levels of distress or guilt in response to the vignettes. As previously, these findings will now be discussed in the context of the relevant literature (see sections 4.4.1 and 4.4.2).

Additional exploratory analyses for the PWT subscales indicated:

(1) When the picture-word stimulus was negative, imagery was significantly positively associated with GI: state and trait guilt subscales. There was no significant association between imagery and GI: state and trait guilt when the picture-word stimulus was positive. However, the significant correlations between negative imagery, state and trait guilt were small (.19) and comparable in size to the correlations found between positive imagery, state and trait guilt (.13 and .15 respectively). Whilst the correlations between positive imagery, state and trait guilt were not statistically significant, they were approaching significance ($p = .06$ and $p = .03$ respectively). As the magnitude of the correlations between positive and negative imagery and state and trait guilt is similar, the small difference found here is likely not meaningful and will not be discussed further in this chapter.

(2) Participants' scores on the 'imagery' subscale showed a significant positive correlation with their scores on the OCI-R, when picture-word pairs were both positive and negative.

(3) A propensity to use a verbal strategy was positively associated with scores on the OCI-R but not GI: state or trait guilt for both positive and negative picture-word pairs.

(4) The 'pleasantness' and 'experiencing' subscales also showed significant positive associations with the OCI-R but not with the GI: trait and state guilt. These significant associations were present when participants responded to both positive and negative picture-word pairs.

(5) Finally, the 'experiencing' subscale showed significant positive associations with both the OCI-R and the GI subscales. Again, these significant associations were present when participants responded to both positive and negative picture-word pairs.

These exploratory analyses show that there were no meaningful differences in the associations between the PWT subscales, OCI-R and GI subscales when participants responded to positive and negative picture-word pairs. The valence of the stimulus did not affect the associations between the PWT subscales, the OCI-R and the GI subscales.

From the analyses described above, it is important to consider that there were significant positive associations between all four of the PWT subscales and the OCI-R, not just imagery. The findings in relation to imagery are discussed in the following section as they are pertinent to Hypothesis 2, but it should be noted that the positive correlations found between the 'verbal', 'pleasantness' and 'experiencing' subscales and the OCI-R may also be of conceptual importance. In addition, the 'experiencing'

subscale was positively correlated with the GI: state and trait guilt subscales. As these correlations were not related to the current study hypotheses they will not be considered further in this chapter, however in future research it would be interesting to explore these correlations further.

It should be noted when considering the findings for Hypotheses 2 and 3 that the PWT imagery subscale measures participants' propensity to deliberately generate imagery, rather than the involuntary spontaneous imagery experienced by people with OCD (e.g., Holmes et al., 2016). When considering the theoretical implications described in the following sections, it should be noted that a propensity to use imagery *generally* was related to level of guilt and OCD symptomatology. It is not possible to comment on whether the specific images experienced by people with OCD were related to levels of guilt and OCD symptomatology as the PWT does not operationalise this construct in a manner that matches the spontaneous experience of imagery, as is true of OCD.

4.4.1 Imagery and guilt. Several researchers have demonstrated that visual representations of information lead to higher levels of emotional arousal than verbal representations (Holmes & Mathews, 2005; Holmes, Mathews, et al., 2008; Pearson et al., 2015). Imagery can involve multiple sensory modalities, including bodily sensations which generate high levels of arousal (Holmes & Mathews, 2010). Intrusive negative imagery has been associated with high levels of negative emotional arousal and the findings of this study are consistent with this, as more frequent use of imagery had a small association with higher levels of state and trait guilt.

In a seminal study on imagery, Lang (1979) found that imagery directly influenced emotional systems in the brain, as the information contained in an image provoked an

immediate autonomic or behavioural response. More recently, Holmes et al. (2008) proposed that imagery uses the same neural processes which are involved in perceiving 'real' events. In a functional neuroimaging study, Cabeza and St Jacques (2007) found that when participants were asked to imagine past and future emotional events, the amygdala (which has been strongly implicated in emotional processing) was activated. It is clear that there is a wealth of evidence which demonstrates that there is a link between mental imagery and emotional arousal. If imagery is linked with emotional arousal, it is possible that in OCD one of these emotions could be guilt, amongst other emotions such as anxiety. This could account for the significant association between imagery and guilt found in the current study.

4.4.2 Imagery and OCD symptomatology. In OCD, it has been proposed that there is a direct link between intrusive imagery, emotional arousal and compulsive behaviour (Rachman, 2007). Images can seem very real when they are associated with high levels of emotional arousal, as the experience of intense emotion can 'block' people from attending to other relevant information (Holmes & Mathews, 2010). People with OCD 'foresee a wide range of possible negative outcomes' which they believe are highly likely to happen (Salkovskis et al., 1995). This may be because an imagined future event causes a strong emotional response such as anxiety or guilt which is difficult to ignore. If people are visualising potential harm happening to other people, it follows that they experience high levels of guilt and act compulsively to neutralise distress. The association between imagery and OCD symptomatology found in the current study could be understood in this way.

Confirming the association between the experience of intrusive imagery and OCD symptomatology, Speckens et al. (2007) found that up to 81% of people with severe

OCD reported intrusive mental imagery and, in 76% of these participants, this imagery resulted in increased engagement in compulsive behaviours. Rachman (2007) found that intrusive images of contamination such as germs invading the skin led to episodes of compulsive washing or cleaning behaviour. Intrusive images are clearly associated with OCD symptomatology and this finding was replicated in the current study. However, it is important to note that the methodology used can only demonstrate an association between imagery and OCD symptomatology, rather than a causative link between intrusive images and compulsive behaviour.

4.4.3 Guilt and OCD. People typically experience guilt when they feel responsible for a transgression (Chiang, 2013). In OCD, people often believe they are responsible for preventing harm from happening and this harm is interpreted as the result of a personal transgression, so people experience guilt (e.g., Mancini & Gangemi, 2004). In a meta-analysis, Shapiro and Stewart (2011) found that people with OCD have higher levels of both state and trait guilt than the general population, although this evidence was mixed. In the same meta-analysis, Shapiro and Stewart (2011) noted that guilt is an important predictor of distressing content in intrusive thoughts and images.

In the current study, both state and trait guilt were significantly correlated with OCD symptomatology and the size of this correlation was large (Cohen, 1992b). Mancini and Gangemi (2004) proposed that guilt is an important contributory factor to OCD symptomatology, above and beyond responsibility. They state that compulsive behaviour occurs when people are afraid they will feel guilty as a consequence of a negative outcome. This fear of guilt then becomes a key component in the development of self-defeating patterns of behaviour (Jones & Kugler, 1993). It

therefore follows that guilt has been linked to moral, sexual and religious obsessions, as well as aggressive, contamination-related and doubting compulsions (Shapiro & Stewart, 2011). Mancini, Gangemi, Perdighe, and Marini (2008) also found that feelings of guilt are linked to not-just-right-experiences in people with OCD. There is clear support in the literature for an association between guilt and OCD symptomatology, as was found in the current study.

Both state and trait guilt were found to be significantly associated with OCD symptomatology, however these constructs may be related to OCD in subtly different ways. Given the correlational design of this study it is not possible to draw any conclusions about the direction of the relationship between state guilt, trait guilt and OCD. However, the relationships between state guilt, trait guilt and OCD symptomatology described in the existing literature will be discussed here in order to consider the reasons for the significant association found in this study.

In a study with a non-clinical population, Gangemi et al. (2007) induced state guilt in participants and found that people with high levels of trait guilt were more likely to evaluate a negative event as both probable and severe than individuals with low levels of trait guilt. The interaction between state and trait guilt meant that people displayed a similar probability bias to people with OCD, as participants with an underlying disposition to guilt (trait guilt), who felt guilty in that moment (state guilt) evaluated negative events as more likely to occur.

Considering state guilt separately, several researchers have found that people with OCD process transient feelings of guilt more efficiently than the general population (Hennig-Fast et al., 2015; Jankowski & Takahashi, 2014). This could mean that people with OCD more frequently experience state guilt and have developed a

habituation response to it, which then becomes associated with learned compulsive behaviour. In support of this idea, D'Olimpio et al. (2013) found that when guilt was induced in people with OCD, this led to more subjective OCD-like experiences and a higher frequency of checking behaviour than in healthy controls or anxious participants. There is evidence that people with OCD may be more sensitive to the experience of state guilt and could therefore be affected by it in a different way from the general population.

In summary, there is considerable support in the literature for an association between guilt and OCD symptomatology, as found in the current study. However, the direction and nature of the relationship between different types of guilt and OCD symptomatology remains unclear. This will be explored further in the suggestions for future research and clinical implications set out later on in this chapter.

4.5 Hypothesis 3 – main findings and theoretical implications

'State and trait guilt will mediate the relationship between imagery and OCD symptomatology.'

This third and final hypothesis was supported by the results of the multiple mediation analysis, as state and trait guilt partially mediated the relationship between imagery and OCD symptomatology. Considered separately, state and trait guilt were also significant mediating variables between imagery and OCD symptomatology.

Regression coefficients indicated firstly that more frequent use of imagery was associated with higher scores on the trait and state guilt subscales of the GI and secondly that higher scores on the trait and state guilt subscales were associated with higher levels of OCD symptomatology. In addition to the literature previously

described in relation to Hypothesis 2, the overall connection between imagery, guilt and OCD symptomatology will now be explored.

In a recent study exploring imagery, when people were asked to imagine harm in vivid detail, moral considerations became more salient because people felt more involved in a scenario and had a stronger emotional reaction (Caruso & Gino, 2011). Similarly, Amit and Greene (2012) found that when people used a more visual cognitive style, they demonstrated higher levels of emotional arousal and were more likely to make an absolute judgment that ‘harm is wrong’. Other researchers have also found that when participants were presented with an image of a potential victim of harm or a scenario containing vivid descriptive details of harm, they had stronger aversive physiological reactions and were more likely to evaluate potentially immoral behaviour as morally wrong (Bartels, 2008; Conway & Gawronski, 2013). Clearly, imagery affects emotional arousal and consequently the moral decisions that people make. When people visualise or imagine harm, it seems likely that they feel guilty about the potential of causing harm, as discussed in relation to the previous hypothesis.

The experience of state guilt has been shown to drive compulsive behaviour similar to that seen in OCD (reassurance-seeking, repeated checking, washing or other compensatory rituals; Mancini & Gangemi, 2004). It could be that an intrusive image depicting harm causes people with OCD to feel guilty for having a negative thought, as well as guilty about the prospect of causing harm. This intense feeling of state guilt then triggers an increase in compulsive behaviour which is intended to reduce or neutralise the experience of negative emotion. In this way, state guilt could mediate the relationship between intrusive imagery and OCD symptomatology. As discussed

previously, people with a high level of trait guilt may also be more sensitive to the experience of state guilt (Gangemi et al., 2007).

Recent research has shown that people with OCD may be more sensitive to the experience of state guilt than non-clinical controls (Reuven et al., 2013). In this study, when people with OCD were made to feel guilty, they were significantly more likely than control participants to subsequently engage in compulsive washing behaviour ('the Macbeth effect'). Relating this example to the current study, it is possible that people with OCD experience intrusive images of contamination which exacerbate feelings of guilt, leading to compensatory compulsive behaviour to manage their negative emotion.

Alternatively, thought-action fusion may be an important concept in understanding the link between imagery, guilt and OCD symptomatology. Shafran, Thordarson, et al. (1996) pointed out that this cognitive bias means people with OCD view intrusive thoughts and harmful actions as morally equivalent. When people with OCD experience intrusive imagery, they interpret this as meaning they are a bad person for having that thought and it follows that they would feel guilty and act compulsively in an attempt to neutralise their distress.

To summarise, people with OCD frequently experience intrusive thoughts which often take the form of mental images. If people with OCD have a pre-existing inclination to guilt (trait guilt), when they experience intrusive images they are more likely to feel guilty in response (state guilt) and to respond in a manner intended to reduce their distress (OCD symptomatology). In this way, state and trait guilt could partially mediate the relationship between imagery and OCD symptomatology, as was found to be the case in this study. However, the design of the study does not allow

conclusions to be drawn about the causal relationships between variables and this possible explanation should be interpreted with caution. Accordingly, this chapter will now proceed to discuss the main strengths and limitations of the current study.

4.6 Strengths and limitations

This study aimed to synthesise the research into imagery and morality in people with OCD due to the clear links in the existing literature between imagery, emotion, morality, and OCD symptomatology. The purpose of the study was to explore how these fragmented areas of research could combine to contribute to our theoretical understanding of the development and maintenance of OCD. The strengths and limitations of this study will now be discussed, to consider how successful the study was in achieving these aims.

4.6.1 Design. This study used a cross-sectional design which means that as previously mentioned, it was not possible to draw conclusions about the potential causal nature of the relationships between variables. This did not have any significant implications for Hypotheses 1 and 2, where causation was not implied. However, given the nature of Hypothesis 3, it would have been interesting to investigate whether the statistically significant partial mediation found between imagery and OCD symptomatology via state and trait guilt, was supported by an experimental design. This would enable more robust conclusions to be drawn about the nature of the relationship between imagery, guilt and OCD symptomatology.

4.6.2 Sample. The current study recruited a convenience sample, using the internet to advertise. This methodology ensured that the research was highly visible, accessible and exceeded the number of participants required by the initial power calculation. The study had sufficient statistical power to detect effects while minimising the likelihood of a Type II error (Field, 2009).

Both the low- and high-OC groups were recruited from a diverse range of websites (reddit.com, facebook.com, twitter.com, callforparticipants.com, studentminds.org.uk, ocdaction.org.uk), in addition to the Royal Holloway university participant credit and prize draw pools. As the participants were recruited from a range of sources, this made the sample heterogeneous and more likely to be representative of the general population. Descriptive statistics (see Table 3.5) indicated that the sample was diverse in terms of age, ethnicity, educational level and gender, across both the low- and high-OC groups. However, the low- and high-OC groups differed significantly on age and education. Previous research has shown that people's education level does not affect how they respond to moral dilemmas but age does have an effect (Kohlberg &

Kramer, 1969). Age was controlled in all statistical analyses wherever possible, however it might also have been worth considering controlling for participants' level of education.

Whilst the online methodology generated a large sample size, previous researchers have identified that in web-based research it is impossible to control the accuracy of participants' responses to questions (Hauser et al., 2007). However, the internet is increasingly being used as a valuable research tool and when comparisons are made between web-based and more traditional pen and paper studies, typically the results are very similar (Baron & Siepmann, 2000). Participants' responses to the moral dilemmas were checked for sense, consistent with the methodology described in Cushman et al. (2006). This criterion led to the removal of 13 participants' data (6% of the participants who completed the survey) which indicated that 94% of the participants provided the expected responses. Overall, there were very few missing data points for those participants who completed the survey, and it appeared that the quality of the data was good.

4.6.3 Analyses. During data screening and analysis, it became apparent that a number of the variables in the study were not normally distributed. Data transformations were attempted, however these failed to address significant skew and kurtosis. Bootstrapping procedures were therefore used to address the problems with the data and it has been argued that this is a satisfactory and robust method (Singh & Xie, 2008).

As described in the Results chapter, 'age' was controlled for in analyses wherever possible due to the significant difference found between low- and high-OC groups, as moral reasoning varies depending on developmental stage (Kohlberg & Kramer,

1969). There were also significant differences found between the low- and high-OC groups on both the HADS-A and HADS-D subscales. As mentioned previously (see Section 2.3.3) there is considerable comorbidity between OCD, anxiety disorders and depression (Adam et al., 2012). It is possible that the significant associations found between OCD symptomatology, imagery and guilt could be related to anxiety or depression rather than OCD symptoms, as anxiety and depression were not statistically controlled for in the relevant analyses. However, as there is considerable conceptual overlap between anxiety, depression and OCD symptomatology, it could be argued that controlling for anxiety and depression would be a stringent analysis strategy which would remove some of the variance attributable to OCD symptomatology. Future research might employ designs capable of separating out the effects of anxiety and depression without removing substantive OCD variance.

4.6.4 Attrition. As mentioned in Chapter 2 (see Figure 2.1), there was a high rate of attrition from the study (59%). A previous thesis which used similar methodology had an attrition rate of 45% (Trafford, 2016). A recent meta-analysis found that the drop-out rate from web-based research studies ranged from 2 to 83% ($M = 31\%$; Melville et al., 2010), meaning that attrition in this study was above average.

Most participants dropped out on the initial introduction, information and consent pages, or during the PWT later in the study. As the introduction, information and consent pages necessarily preceded any demographic information or other questionnaires, it was not possible to draw any conclusions about the characteristics of the participants who dropped out of the study. It may be that when people realised

what was involved in the study or the time needed to take part, they opted not to do so.

Those participants who dropped out during the PWT may have done so due to boredom as the task was very repetitive. The task has previously been used in a lab-based setting where participants were supervised by a researcher, meaning that they were less likely to disengage from the task or become distracted. Sixty-eight participants dropped out during this task, so it would be worth considering alternative methods of measuring visual/verbal cognitive style in future web-based studies. However, the PWT was selected as it has been proposed to be a more accurate measure of imagery than retrospective self-report measures which have been used previously (Holmes, Mathews, et al., 2008). This will be discussed in further detail in the following section of this chapter.

4.6.5 Materials and measures

Picture-Word Task

As described in Chapter 2, the PWT was altered for the purposes of this study so that it was accessible in an online format. The instructions and stimuli remained the same, and the JavaScript functionality available in Qualtrics meant that the stimuli appeared on screen for the same amount of time as in the original lab-based task, so the task remained as similar as possible. Initial piloting of the survey on a small sample found that participants deemed the PWT to be acceptable, however the high drop-out found during the task indicates that this may not have been the case in the study sample. If using the task in future, it might be worth developing a shortened version of the task to test against the existing version, to make the online version of the task more interesting and acceptable to research participants.

Vignettes

Earlier in this chapter, it was suggested that it might have been helpful to include a time limit when the moral dilemmas were presented to participants. Allowing participants an unlimited amount of time to respond might have meant that they became fatigued quickly, or that they were more able to engage in slow and deliberate moral reasoning (Suter & Hertwig, 2011). Participants might also have been more likely to give a considered, socially desirable response. A number of researchers have found that participants have a tendency to make decisions in response to moral dilemmas which are aimed at impression management, rather than decisions which accurately reflect their real responses (Aguilar et al., 2013; Christensen & Gomila, 2012). However, it could be argued that asking participants to complete an anonymous online survey removes the pressure to respond in a socially desirable manner.

Considering the vignettes themselves, the use of moral dilemmas as tools in experimental psychology research has been criticised by some researchers. Bauman et al. (2014) raised concerns about the external validity of moral dilemmas, as they typically require participants to respond to scenarios which describe an artificial context. Thus, it could be argued that the judgments given in these scenarios do not accurately reflect general moral functioning. However, Christensen and Gomila (2012) advocate for the use of moral dilemmas in research, as they suggest that the content of the scenarios can be controlled in order to address a wide range of research questions. Whilst dilemmas are not entirely ecologically valid, they do allow valuable information about underlying psychological processes to be obtained (Moore et al., 2011).

The vignettes used in the current study were identical to those used in the Cushman et al. (2006) paper which investigated the intention bias. There are no recognised standard procedures for validating moral dilemmas for use in research. The accepted practice seems to be that if moral dilemmas have been designed and piloted by experts in the field, they can reasonably be assumed to be valid. As the current study aimed to replicate the findings of the Cushman et al. (2006) study, the use of pre-existing vignettes was good research practice. The current study was successful in replicating the intention bias found in Cushman et al. and the moral philosophy literature (e.g., Foot, 1967).

Measure of OC

The OCI-R (Foa et al., 2002) was an important tool in this study, as people were classified into the low- and high-OC groups used in Hypothesis 1 on the basis of their scores on this measures. Additionally, people's scores on the OCI-R were used in the analyses in Hypothesis 2 and 3. As mentioned in Chapter 2, the OCI-R is relatively brief and has shown good psychometric properties in both non-clinical and clinical populations, so it was selected for use in this study. Ideally, it would have been good to use a structured clinical interview such as the SCID-IV (First et al., 1996) to classify participants into groups, however due to the web-based methodology in this study this was not possible. It is important to bear in mind that the OCI-R only measures the presence of OCD symptoms and is not a valid tool for diagnosis. The current study can only draw conclusions about moral reasoning, imagery and guilt in relation to OCD *symptoms* rather than an OCD diagnosis.

However, the web-based approach was chosen in order to maximise the sample size and increase statistical power. The target sample size was achieved and exceeded,

which may not have been possible if participants had been required to meet with a researcher in person. This would also have compromised the anonymity that was possible with an online sample.

Responsibility beliefs and moral TAF

This study used a single measure of OC phenomena (OCI-R; Foa et al., 2002) to reduce the questionnaire burden on participants. As previously mentioned (see Section 2.3.2), a measure of responsibility beliefs (e.g., RAS; Salkovskis et al., 2000) was not included in the study. However, Franklin et al. (2009) found that there were differences in responsibility between people with OCD and control participants and it could be that there were differences in responsibility beliefs between the low- and high-OC groups in this study. These potential differences could have been important in interpreting the associations found between guilt, imagery and OC symptomatology, as heightened responsibility has been identified as an important construct in OCD (e.g., Salkovskis et al., 1995) and moral reasoning. As responsibility beliefs were not measured in the current study, it is not possible to determine whether any group differences were due to heightened responsibility beliefs. This is a limitation of the study and in future research, it would be useful to consider including a measure of responsibility beliefs.

It could also have been useful to include a measure of moral TAF as this has been shown to be strongly related to responsibility and is relevant to moral decision-making (Shafran & Rachman, 2004). However, Shafran and Rachman's (2004) review of TAF showed that moral TAF is not 'significantly and reliably related' to obsessions or compulsions. The authors suggest that measuring TAF is useful to help people identify dysfunctional beliefs rather than providing a measure of

psychopathology. As this study investigated the relationships between OC symptoms, imagery and guilt, a direct measure of OC symptomatology was considered most suitable.

Survey flow

The order in which participants completed measures was carefully considered (see Table 2.1 for an overview). Due to the high drop-out reported in a similar study (Trafford, 2016), the different measures were split across the survey to maintain participants' interest. Of note, the GI (Kugler & Jones, 1992) was placed between the two blocks of moral dilemmas. It may be that presenting the GI before the second block of moral dilemmas heightened participants' awareness of moral concerns and had an effect on their responses to this second block. However, participants were aware throughout the survey that they would be asked questions pertinent to morality, as the study advertisements and information page referenced 'Moral reasoning and OCD', so it may have been the case that morality was primed throughout study participation. If conducting the study again, it might be helpful to remove references to morality, such that this was not primed, and to consider moving the GI to the end of the survey.

Due to the limitations of the Qualtrics platform and the need to preserve participant anonymity, participants accessed the study by clicking on a link posted on each of the recruitment websites. This meant that it was not possible to track where participants were recruited from. It would have been interesting to explore whether there were any meaningful differences in participants' responses depending on whether they were recruited through the RHUL participant pools, social media, or mental health forums.

If repeating this study, it would be helpful to add a question into the demographic information page to ask how participants found out about the study.

4.7 Suggestions for future research

As mentioned earlier in this chapter, the lack of difference in intention bias between the low- and high-OC groups could be attributed to the fact that the vignettes did not describe OCD-relevant concerns. In investigations of a subtly different moral reasoning bias (omission), researchers only found differences in moral reasoning when the scenarios given to participants were OCD-relevant (Franklin et al., 2009; Wroe & Salkovskis, 2000). It was not possible to develop and validate such vignettes in the timescale given for a DClinPsy research project, however it would be interesting to repeat this study using vignettes that described OCD-relevant concerns. It is possible that any differences in moral reasoning would then become more apparent.

It was also suggested that the study failed to find a difference in intention bias because participants were psychologically distant from the vignettes. To address this, a manipulation which engaged participants in the dilemmas could be used. For example, Conway and Gawronski (2013) showed their participants a photograph of the hypothetical victim described in the moral dilemmas. The literature suggests that using a visual cue would cause participants to behave more empathically (Amit & Greene, 2012) and people with OCD might be more sensitive to this manipulation, meaning they were less psychologically distant from vignettes.

This study adds to the literature which suggests that imagery and guilt are implicated in the development and maintenance of OCD. However, typical measures of OCD symptomatology do not include distressing imagery or pathological guilt. As these

constructs appear to be important, it would be interesting to develop and validate new measures which encompass these additional symptoms.

The adequate measurement of distressing imagery in OCD could also facilitate the development of novel interventions targeted at imagery. Holmes, Lang, et al. (2008) suggested that training people in using positive imagery is an important direction for future research. If distressing imagery is related to negative emotions such as fear, disgust and guilt and positive imagery is linked with reductions in negative affect (Holmes, Mathews, et al., 2008), training people in using positive imagery could be potentially useful intervention in OCD. Shapiro and Stewart (2011) propose that pathological guilt is an important maintenance factor in OCD and an indication for poor prognosis; if a positive imagery intervention could potentially reduce levels of pathological guilt, this would be important to investigate in future research.

Considering imagery further, Holmes, Lang, et al. (2008) and Nelis, Vanbrabant, Holmes, and Raes (2012) have reported mixed findings on how the perspective described during the experience of imagery has an impact on affect. There is some evidence that taking a first-person perspective generates more intense emotion (e.g., Berntsen & Rubin, 2006), however Nelis et al. (2012) did not replicate this finding in the case of positive affect. In the current study, participants were presented with positive and negative picture-word pairs, and asked to combine these either verbally or using imagery. It may be that participants chose to take either a first-person or observer perspective when using imagery and given that this might have influenced their levels of affect, it would be interesting to consider perspective-taking in future research. To design adequate interventions for distressing imagery, it would be useful

to understand the perspective taken by people with OCD when they experience distressing images.

The mediational analyses for Hypothesis 3 showed that state and trait guilt partially mediated the relationship between imagery and OCD symptomatology. As these mediating effects were partial, it would be interesting to consider whether there are other factors in the relationship between imagery and OCD symptoms that could explain the remaining variance. Future research could also make use of an experimental design to test potential causal links between imagery and OCD symptoms. Holmes et al. (2009a, as cited in Holmes et al., 2016) proposed that mental imagery may amplify maladaptive thought processes in depression and it would be interesting to research whether this might also be the case in OCD.

4.8 Clinical implications

This study set out to explore moral reasoning, imagery and guilt in OCD, with a view to contributing to the literature on the development, maintenance and potential treatment of this debilitating disorder. OCD is a complex condition which is associated with considerable suffering, functional impairment and economic burden to both the individual and the health-care system (Markarian et al., 2010). Whilst psychological treatments for OCD have been developed, these remain approximately 50-60% effective and there is considerable scope to improve the understanding and treatment of the disorder (Öst et al., 2015). The study's statistically significant findings in relation to imagery and guilt will now be discussed in terms of their clinical implications.

4.8.1 Guilt. It is clear from the literature that guilt plays a part in the development and maintenance of OCD (Shafran, Thordarson, et al., 1996; Shapiro & Stewart, 2011) and it has been suggested that high levels of guilt negatively affect both the severity of the disorder and likely treatment outcome (Mancini & Gangemi, 2004; Nissenson, 2006). It remains unclear whether unresolved guilt in OCD leads to relapse following an otherwise effective course of treatment, or if guilt is simply an important component in the development of the disorder (Shapiro & Stewart, 2011). Mancini and Gangemi (2004) suggest that high levels of guilt account for the inability of people with OCD to hear and comprehend reassuring information. If people with OCD experience high levels of guilt, this could cause an ‘emotional reasoning’ cognitive bias, meaning that beliefs then correspond with emotions and that it is difficult to process contradictory information (Clark & Beck, 2011). This is supported by findings in both clinical and non-clinical populations which show that the experience of guilt increases compulsive behaviour (D’Olimpio et al., 2013; Gangemi et al., 2007).

The findings of this study provide support for the involvement of guilt in OCD, and it follows that guilt could be an important treatment target. To date, there are very few studies that specifically address pathological guilt as a component in treatment.

Cosentino et al. (2012) proposed that the function of compulsive behaviour is to reduce the distressing experience of feeling guilty. Guilt is appraised as unacceptable and painful, and individuals engage in compulsive behaviour in an attempt to neutralise this negative emotional experience. Cosentino et al. (2012) found that an Acceptance and Commitment Therapy (ACT) intervention designed to increase the acceptability of guilt led to a significant reduction in overt OCD symptoms. It should

be noted that the sample size in this study was small and the researchers did not include a control group for comparison. However, given the strength of the existing evidence in the literature and the findings of the current study, guilt should be considered when assessing and treating OCD. There is considerable scope to develop assessment and treatment protocols which take account of guilt as a maintenance factor.

4.8.2 Imagery. The results of this study also implicated mental imagery in relation to OCD symptomatology, both independently of and in combination with guilt. Recently, increasing attention has been paid to imagery as a key maintenance factor in a number of clinical disorders (Holmes et al., 2016; Holmes & Mathews, 2010). The perceived reality of clinical imagery seems to lead to increased emotional arousal which then influences behaviour and beliefs (Pearson et al., 2015).

Speckens et al. (2007) noted that 76% of people with severe OCD report intrusive imagery, and these distressing images are directly linked with engagement in compulsive behaviour. The current study suggests that the experience of distressing imagery is exacerbated by guilt, and this links with increased OC symptoms.

However, as the design of this study was cross-sectional and mediation analysis implies a causal relationship between variables, this potential finding should be interpreted with caution. When mediation analysis is based on a cross-sectional design, it is only possible to claim that the findings are ‘compatible with a causal model’ rather than asserting that causality has been proven (Haase, Mountford, & Waller, 2007). This study has demonstrated that there are relationships between imagery, guilt and OC symptomatology but it cannot prove the direction of causation. It is tentatively suggested on the basis of existing theory that the experience of

imagery and subsequent guilt are distressing, and so people with OCD engage in compulsive behaviour to reduce their distress and guilt and reassure themselves that the imagined negative outcome will not happen in reality.

If distressing imagery leads to such a strong emotional response (guilt or other emotions), it is important that imagery is assessed in the context of psychopathology (Holmes et al., 2016). Often, the focus in clinical assessment is on verbal cognitions, meaning that the focus in treatment remains on verbal techniques (e.g., thought challenging in CBT). There is now a developing evidence base for the use of therapeutic mental imagery techniques in a range of clinical presentations (Ji et al., 2015; Pearson et al., 2015). Using mental imagery may provide a more direct route to modifying distressing emotion in CBT than verbal thought challenging (Holmes, Mathews, et al., 2008).

There is tentative evidence that imagery rescripting to update the meanings of aversive memories could be effective in OCD (Arntz, 2012; Veale et al., 2015).

However, this technique would only be effective in a subgroup of people with OCD who have intrusive images that are emotionally linked with an aversive memory. In a recent study (case series), Mpavaenda (2016) found that one participant out of six demonstrated a reduction in the vividness of intrusive imagery, combined with a reduction in shame, guilt and OCD symptoms. This participant was experiencing intrusive images related to a previous traumatic event. This study therefore provided limited evidence that imagery rescripting could be an effective treatment for intrusive imagery in OCD *only* when intrusive imagery is related to a previous traumatic event.

4.8.3 Contribution to current knowledge. This study aimed to explore moral reasoning processes in OCD and constructs (imagery and guilt) that could account for potential differences in moral reasoning. Morality in OCD has previously been researched, in relation to deontological and utilitarian principles, the ‘omission bias’, and personal/impersonal moral dilemmas, however to the author’s knowledge the ‘intention bias’ has not been investigated in relation to OCD. It was proposed that due to TAF (Shafran, Thordarson, et al., 1996), people with OCD might interpret having a ‘bad’ thought as morally equivalent to harm that occurs in reality, especially as people with OCD are more sensitive to moral concerns than the general population (Melli et al., 2017). This ‘moral equivalence’ could mean that people with OCD understand intention differently and do not display the intention bias found in the general population. However, the findings of this study were not consistent with this prediction, as they demonstrated that people with both low and high levels of obsessive-compulsiveness make moral decisions consistent with the ‘intention bias’. This study adds to the limited evidence that there is no general moral reasoning difference in people with OCD and consistent with previous research, any moral reasoning differences may be limited to specific domains (Franklin et al., 2009; Wroe & Salkovskis, 2000). It also provides novel evidence that the intention bias is present in people with both low- and high- levels of OC.

The current study also explored imagery and guilt and how these constructs are related to OCD symptomatology. There are clear links in the existing literature between imagery and affect, particularly negative imagery and anxiety, fear and disgust (Holmes et al., 2016; Ji et al., 2015). As negative emotions, including guilt, are key maintaining factors in OCD (Shapiro & Stewart, 2011), it was proposed firstly

that there may be a positive association between guilt, imagery and OCD symptomatology and secondly that guilt may mediate the association between imagery and OCD symptomatology. The findings of this study were consistent with these predictions, therefore taking into account the limitations described earlier in this chapter, this study provides tentative evidence that guilt is another negative emotion evoked by distressing imagery. A better understanding of the links between guilt and imagery could further our conceptual understanding of OCD and help to develop new cognitive-behavioural, imagery or emotion-focused treatments.

4.8.4 Summary and conclusions. This study provides support for the involvement of distressing imagery, state and trait guilt in OCD symptomatology. Specifically, there was an association firstly between imagery and state and trait guilt, and secondly between imagery and OCD symptomatology. State and trait guilt partially mediated the relationship between imagery and OCD symptomatology. The main hypothesis regarding altered moral reasoning in OCD was not supported, however it was tentatively proposed that if the scenarios presented had been relevant to OCD-type concerns, the expected effect might have been found. This was noted accordingly in the suggestions for future research.

The existing literature suggests that imagery and guilt (in some form) are both important factors in the development and maintenance of OCD, and the findings of the current study confirm this. However, to date, researchers have proposed that state guilt, trait guilt, deontological guilt or a fear of guilt could all be implicated in OCD symptomatology, and there is no clear consensus on the type of guilt which is most relevant. Whilst this study provides some evidence in favour of the involvement of

state and trait guilt, this is by no means definitive and further research into the accurate measurement and description of guilt in OCD is clearly required.

However, there is an emerging evidence base regarding the clinical utility of interventions tailored to pathological levels of guilt and distressing imagery. These studies show small but clinically meaningful treatment outcomes, and the findings of the current study suggest that designing interventions with these factors in mind could lead to a much-needed improvement in treatment outcomes for people with OCD.

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Appendices

Appendix A: Example study advertisement

Moral reasoning in Obsessive Compulsive Disorder

My name is Rebecca Dale. I am a Trainee Clinical Psychologist studying at Royal Holloway, University of London. I am supervised by Dr Olga Luzon (Clinical Psychologist) on a doctoral research project looking at moral decision making in OCD.

What is this study about?

This research looks at some of the factors which may be involved in how people make moral decisions. Specifically, we are interested in whether there are similarities and differences in how people with and without a diagnosis of OCD make decisions. A clearer understanding of decision making processes in OCD could help to explain the disorder and to develop more effective psychological treatments.

What are the possible benefits of taking part?

There are not expected to be any direct benefits to you as a result of taking part in this study. However, we hope that the information we get from this study will potentially improve the treatment of people with OCD in the future.

Who can take part?

We are aiming to recruit as many adults (18+) as possible with and without symptoms of OCD.

What do I need to do?

If you choose to take part, you will be asked to complete an anonymous online survey which should take approximately 45 minutes to complete. The survey is composed of short questionnaires about mood, a series of moral dilemmas for you to read and answer questions about and a task to classify your style of thinking (visual or verbal).

If you complete the survey, we will enter you into a prize draw to win one of four £25 Amazon vouchers as a thank you.

How do I take part?

Please follow this link if you would like to read more information about the study and to take part: https://rhulpsychology.eu.qualtrics.com/SE/?SID=SV_a93pI9mlOKaVtsx
Downloads:

 [Information Sheet](#)  [Ethical Approval](#)

Appendix B: Social media recruitment

Facebook page interface for "Moral Reasoning research" (@moralreasoningresearch).

The page header shows the URL: https://www.facebook.com/moralreasoningresearch/about/?tab=page_info.

The page features a profile picture of a scales of justice and a cover photo featuring the Royal Holloway University of London crest and the text "ROYAL HOLLOWAY UNIVERSITY OF LONDON".

The page is categorized as "Community".

The page information table is as follows:

PAGE INFO	
Category	Community
Name	Moral Reasoning research
Username	www.facebook.com/moralreasoningresearch
Start date	Enter your start date
Short description	This page promotes an online psychological research study sponsored by Royal Holloway, University of London.

Appendix C: Demographic questionnaire

About you

You will be asked some brief demographic questions. You may choose to answer with 'prefer not to say' for any or all of these questions.

1. Please select the gender you identify with

Male

Female

Other (please describe)

Prefer not to say

2. Please enter your age in years

3. Please select your ethnicity from the drop down menu

4. Please select the highest level of academic qualification you have completed

No formal qualifications

GCSE or equivalent

BTEC or equivalent

A levels or equivalent

University degree or equivalent (e.g. BA/BSc)

Masters degree

Doctorate

Prefer not to say

Not sure

5. Please describe your religion

No religion

Christian (including C of E, Catholic, Protestant and all other Christian denominations)

Buddhist

Hindu

Jewish

Muslim

Sikh

Any other religion (please describe)

Not sure

Prefer not to say

6. Please select your marital status

Single

Cohabiting

Married

Civil partnership

Separated but still married or in a civil partnership

Divorced or previously in a civil partnership which is now dissolved

Prefer not to say

7. Please describe the first language you speak (write in)

Appendix D: OCI-R

Not included for copyright reasons

Appendix E: HADS

Not included for copyright reasons

Appendix F: Guilt Inventory

Not included for copyright reasons

Appendix G: Moral dilemmas

Not included for copyright reasons

Appendix H: Picture-Word Task

Q37 Picture Word Task Instructions:

On every trial you will see one picture paired with one word. There are a total of 20 pictures and 40 words, so each picture is paired with two different words (one at a time), the order you will see them is random. What we want you to do is to COMBINE each picture with the word shown below it. For example: Sour How could you combine these? You can think of a sentence, for example - the sour lemon made a delicious pie. Or you could imagine how a sour lemon might look and taste. Ok, let's go through the task... Press 'next' to continue.

Q38 Example

So, on each trial you will see the picture and word on the computer screen:

Image - displayed here (not included due to copyright restrictions)

Word - displayed beneath picture (not included due to copyright restrictions)

Now please COMBINE this picture and word...

Q140 In the real task the picture and word is only shown for a limited time, after that you are going to see a blank screen. As soon as you have finished combining, just press NEXT. There is no need to repeatedly generate multiple combinations. Once you press 'NEXT', a series of questions will follow.

Appendix I: Information Sheet

Information for participants

What is the purpose of the study?

This study looks at some of the factors which may be involved in how people make moral decisions. Specifically, we are interested in whether there are similarities and differences in how people with and without a diagnosis of OCD make decisions. We are aiming to recruit as many adults as possible with and without symptoms of OCD. A clearer understanding of decision making processes in OCD could help to explain the disorder and to develop more effective psychological treatments.

Do I have to take part?

It is up to you to decide whether you wish to take part in the research. You can contact the research team if you would like to speak further before deciding whether or not you would like to participate. You will be asked to complete an online consent form to show you have agreed to take part. You are free to withdraw from the study at any time, without giving a reason. If you are a student at Royal Holloway University, withdrawing from the study will not affect your education.

What will the study involve?

You will be asked to complete an online survey which should take approximately 45 minutes to complete. The survey is composed of short questionnaires about mood, a series of moral dilemmas for you to read and answer questions about and a task to classify your style of thinking (visual or verbal).

What are the possible disadvantages/risks of taking part?

There are no anticipated risks to taking part in this project. However, the questionnaires ask about your mood and there is a small risk you may feel worried or distressed. If this is the case, please either contact the lead researcher (Rebecca Dale – Trainee Clinical Psychologist) for advice about support, or you will find further information about useful contacts at the end of the survey.

What are the possible benefits of taking part?

There are not expected to be any direct benefits to you as a result of taking part in this study. However, we hope that the information we get from this study will potentially improve the treatment of people with OCD in the future. As a thank you for your time, we will enter everyone who completes the study into a prize draw to win one of four £25 Amazon vouchers.

What if there is a problem?

If you have any concerns, you should initially contact the researchers, Rebecca Dale or Dr Olga Luzon, who will do their best to address your concerns (see contact details below). If you remain unhappy and wish to complain formally, you can contact the sponsor of this study, Royal Holloway University (Tel.: 01784 414 012).

Will my taking part in this study be kept confidential?

Yes. Only the researchers will know whether you have taken part. Your questionnaire responses will be anonymised by giving them a unique identification code and this information will be stored in a password-protected database. Your consent will be stored separately from the anonymous information you provide for the research project. If you choose to provide your email address to be entered into the prize draw or to receive a summary of the results, this will be stored in a part of the database that is separate from other responses, so there will be no connection between your identity and your answers. Your contact information will not be used for any other purpose.

What will happen to the results of the study?

This study forms part of a doctoral thesis and is intended for submission for publication in a relevant peer-reviewed journal. No individual participants will be identifiable in any written report resulting from this study. If you provide your email address, a summary of the findings will be available to you after the study has ended.

Who is organising and funding the research?

The study is organised and funded by Royal Holloway, University of London, as part of the Doctorate in Clinical Psychology for Rebecca Dale.

Who has reviewed the project?

The study has been reviewed by Royal Holloway, University of London Psychology Department Ethics Committee and given approval.

If you would like to participate or wish to discuss the study further you can contact:

Lead researcher: Rebecca Dale, Trainee Clinical Psychologist (Royal Holloway, University of London)

Email: Rebecca.dale.2014@live.rhul.ac.uk Telephone: 01784 414 012

Academic supervisor: Dr Olga Luzon, Clinical Psychologist (Royal Holloway, University of London)

Email: Olga.luzon@rhul.ac.uk

Thank you for reading this information!

Appendix J: Consent

Consent form

Please read and respond to the following statements. If you do not wish to continue at any point, please close the survey window.

1. I have read and understood the information sheet for the study. I have been offered the opportunity to contact the research team to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without my legal rights, medical care or education being affected.
3. I understand that the information I provide will be treated as confidential, and I will not be identifiable in any publications resulting from the study.
4. I am aware that this study involves completing questionnaires about my emotional wellbeing.
5. I agree to take part in the above study.

Yes

No - please close the survey window if you do not wish to continue

Appendix K: Ethical approval

Professor Paul Hogg
C.Eng, C.Sc, FMMM
Vice-Principal for Research and Enterprise
& Dean of Science

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27th July 2016

Project Title: Moral reasoning in Obsessive Compulsive Disorder (OCD): the effect of guilt and imagery on the intention bias. (1516-142)

This letter is to confirm that Rebecca Dale has completed ethical review via the College's review procedure for the above project. Further information on this process can be found on the following webpage:

<https://www.royalholloway.ac.uk/liquid/services/researchsupport/ethics/ethicsandgovernance.aspx>

Kind regards

A handwritten signature in black ink, appearing to read 'Paul Hogg'.

Professor Paul Hogg
Chair of Research Ethics Committee

Appendix L: Debrief

Debrief

Finished!

Moral reasoning processes in Obsessive Compulsive Disorder (OCD)

Thank you for taking the time to participate in this research. You have now completed the study and we are extremely grateful for your time and assistance!

The purpose of this research is to investigate different ways of thinking about and making decisions in ethically difficult situations.

We hope that by understanding how people make decisions, that we might be able to learn about how people develop OCD. The research could help to explain the disorder and to design more effective psychological treatments.

If you would like a summary of the research findings once they are available, please enter your email address below:

If you would like to be entered into a prize draw to win one of four £25 Amazon vouchers, please enter your email address below (you will need to enter it a second time if you have already chosen to receive a summary):

Who can I contact if I have any questions?

If you would like any further information about this study, please feel free to contact the research team:

Lead researcher: Rebecca Dale, Trainee Clinical Psychologist (Royal Holloway, University of London)

Email: Rebecca.dale.2014@live.rhul.ac.uk Telephone: 01784 414 012

Academic supervisor: Dr Olga Luzon, Clinical Psychologist (Royal Holloway, University of London)

Email: Olga.luzon@rhul.ac.uk

To download a copy of these contact details, please click the link below:

[Contact details for survey](#)

Who can I contact if I need further support?

If you feel that completing the questionnaires has caused you to feel distressed or worried in any way, please find below information about useful contacts:

- During working hours, please contact your GP
- If you are in need of urgent advice please call NHS Direct on 0845 46 47 or the Samaritans on 08457 90 90 90 (or 116 123 for free from a BT landline)
- If you are a student at Royal Holloway University: Student Counselling - 01784 443128 or counselling@royalholloway.ac.uk.
- MIND – a mental health charity who can provide information and support to people experiencing mental health difficulties. Helplines are open Monday to Friday, 9:00am to 5:00pm.

Telephone: 0845 766 0163.
Email: info@mind.org.uk.
Website: www.mind.org.uk.

- **If you are need immediate help or are in crisis:** Call 999. Alternatively you can go to your nearest Accident & Emergency department (A&E).

Thank you again for taking part in this research, we really appreciate your contribution!

Please press 'next' to complete the survey and save your answers.

Appendix M: Picture-Word task stimuli (examples)

Not included for copyright reasons